Sheep and Goat Dairy Market Conditions and Consumer Research

Prepared by Atlantic Corporation for the Northeast Dairy Business Innovation Center

FINAL REPORT

ATLANTIC CORPORATION

NORTHEAST DAIRY BUSINESS INNOVATION CENTER

Abstract

This report was prepared by Atlantic Corporation for the Northeast Dairy Business Innovation Center (NE-DBIC), hosted by the Vermont Agency of Agriculture, Food & Markets (VAAFM), under Contract #40639. The goal of this project was to conduct market, consumer, and stakeholder research on goat and sheep dairy products to determine regional consumer demographics, assess consumer preferences, define optimal distribution channels, and identify marketing strategies and innovations to improve and expand opportunities for Vermont goat and sheep farms.

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About Atlantic

Atlantic Corporation is a leading agricultural business and economic research and development firm, conducting important market research for local food, agriculture, and aquaculture development, often spearheading large-scale public-private research collaborations and projects. We have completed major market assessment projects for the USDA through their SBIR, AFRI, and LFPP grant programs; NOAA; and many state governments, non-profits, and commercial enterprises. Our work has been widely published in white papers, reports, agricultural economics journals, and presented at regional and national conferences.

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Introduction

Atlantic Corporation (Atlantic) completed a comprehensive market research report as well as an interactive data dashboard on consumer preferences for goat and sheep dairy products for the Northeast Dairy Business Innovation Center (NE-DBIC). To accomplish these deliverables, Atlantic conducted secondary market research of existing literature regarding the goat and sheep dairy industry, implemented a consumer preference survey of 597 Northeastern consumers, and conducted a business-to-business (B2B) survey of 26 New England sheep and goat dairy farms.

This detailed market research will help sheep and goat milk producers accurately assess the best markets, packaging options, and marketing activities to expand product lines and distribution, ultimately resulting in more profitable operations. With the culmination of a comprehensive research report and an easy-to-use, interactive data dashboard, this project supports the NE-DBIC's aim "to strengthen industry engagement, improve strategic planning, and support business development and financial success to grow this sector of agriculture."

The following objectives were completed, as described in the subsequent sections of this report:

1. Conduct a Domestic Consumer Demographics and Insights Survey. The goal of this objective was to generate meaningful data to understand market conditions, gaps, opportunities, and roadblocks relevant to sheep and goat milk operations.
2. Conduct a B2B Sheep and Goat Milk Industry Survey. The goal of this objective was to map out the most effective sales channels for Vermont and New England-based sheep and goat dairies based on first-hand accounts of previous market successes and failures.
3. Analysis of Global Market Conditions and Context. The goal of this objective was to develop a comprehensive understanding of global markets, identify key factors that may influence producers' competitiveness, and potential avenues to improve market advantage.
4. Prepare Final Report and Interactive Dashboard. The goal of this objective was to aggregate all findings and methodologies for the project to produce a final report for sheep and goat dairy farmers and to develop a web-based interactive data dashboard for users to access and assess project data.

Executive Summary

Atlantic conducted comprehensive mixed-methods market, consumer, and stakeholder research of sheep and goat dairy products for the NE-DBIC to assess consumer preferences, define optimal distribution channels, and identify strategies to improve and expand opportunities for U.S. sheep and goat dairy producers and handlers. Our research consisted of the following components: primary quantitative consumer research; secondary market research; and qualitative business-to-business (B2B) research. Key findings are highlighted in this summary.

Consumer Preferences

Atlantic developed and implemented a consumer insights survey of 597 Northeast consumers to determine attitudes and preferences about sheep and goat dairy products, including cheese, milk, and yogurt. Key findings are as follows:

- Of the sheep and goat dairy products assessed, cheese was the most consumed, and may be the leading product for sheep and goat dairy given its broad general appeal. Plant-based products dominate market share for milk and yogurt alternatives.
- According to consumer liking ratings among those who tried the dairy types, cow dairy products were liked the most, followed by sheep dairy then goat dairy. Sheep and goat dairy products were still liked by half to two-thirds of those who tried them.
- Customer segments to target include those ages 18-44 years as well as households with children under the age of 18 years, as households of both groups had high rates of dairy consumption and spending. These consumers were significantly more likely to trial and consume sheep and goat dairy products.
- In general, most consumers do not perceive sheep and goat dairy products as available for purchase at their usual retail channels. Goat cheese was perceived to be available by half of the respondents, but far fewer respondents viewed all other sheep and goat dairy products as available for purchase.
- Fewer respondents are willing to pay premium pricing for sheep or goat dairy over cow dairy, and the same holds true for local over non-local dairy, as well as organic over conventional. However, those willing to pay premiums are willing to pay up to 39% more for sheep or goat dairy over cow dairy depending on the product. While the customer segment willing to pay premiums for sheep or goat dairy may be smaller, the profit margins could make up for it.
- Providing samples to consumers should lead to higher rates of purchasing, as respondents stated that they purchased an average of one-third to one-half of the sheep and goat dairy products they sampled.
- The survey revealed preferred packaging types and sizes for each product and dairy type. For goat and sheep dairy, smaller packaging was preferred across all product types. Half-gallon and quart sizes for milk, 8-oz to 4-oz packaging for cheese, and single-serve 5-oz to 6-oz cups for yogurt.

B2B Survey of Industry Stakeholders

Atlantic conducted informal qualitative interviews with 26 sheep and goat dairy stakeholders to assess the most effective sales channels and identify common challenges in the industry.

- Sheep and goat dairy producers may find the most success in urban, local markets, where consumers are more willing to pay premiums for local products. Almost all producers interviewed would prefer to be in local markets and they believe consumers are willing to pay up to 35% more for local products. Although the consumer survey showed that fewer respondents are willing to pay for local dairy, the premiums they are willing to pay for local goat and sheep dairy align with producer estimates, at least for milk products.
- Direct-to-consumer online sales and partnerships with neighboring farms were strategies developed during the pandemic that proved to be profitable. E-commerce is an emerging sales channel that became common during the COVID-19 pandemic and its utilization is predicted to continue rising after the pandemic.
- Most respondents handle their own distribution. Factors limiting distribution included challenges in scaling operations to produce more volume given a lack of infrastructure. Many farms surveyed are just starting out and lack critical distribution components (trucks, storage, and space). Others expressed hesitancy in outsourcing to wholesale distributers due to small profit margins.
- Sheep and goat dairy farms use many marketing strategies such as humor, bright and colorful packaging, and social media, which have proven to be successful. Offering samples was another successful marketing strategy noted by respondents, which aligns with the findings from the consumer survey indicating that sampling can drive purchases.
- More marketing is needed to increase awareness and educate consumers on the benefits of these products. Producers indicated a large need for additional assistance and resources to help craft marketing plans and sponsor advertising.

Analysis of Market Conditions

Atlantic conducted robust secondary market research to assess U.S. and global trends in production and consumption, describe the competitive landscape, and identify compelling opportunities for production and marketing.

- The global goat milk market size was valued at $8.5 billion in 2018 and is expected to reach $11.4 billion by 2026. The majority of goat milk produced is used for direct consumption. The remaining milk is used for cheese production, followed by milk powder and other products.
- The demand for goat and sheep dairy products is steadily rising in the global market. An estimated 65% of the world’s population consumes goat milk, with the majority consumed in Asia, particularly in India.
- Although most goat dairy production and consumption occurs in Asia, North America is the second largest market for goat dairy, and the U.S. industry continues to evolve. There are over 35,000 goat dairy farms in the U.S., and total sales topped $35 million in 2017. The New England region has 1,570 goat dairy operations.
- The U.S. and Germany are leading importers of sheep cheese, accounting for 42% and 41%, respectively, of all sheep cheese imports. Both the U.S. and Germany could serve as a potential market for U.S. producers if they can capture a share of the imports.

- Market trends driving growth in the global industry include population growth and emerging economies, government subsidies, technological development, trends in convenience foods and snacking, and health and wellness.
- There are numerous health benefits of sheep and goat dairy products that producers can capitalize on as health awareness is rising. Goat milk contains important amino acids, calcium, Vitamin A, and other vitamins and minerals, while sheep milk is high in fatty acids, immunoglobulins, proteins, and vitamins. Goat milk is also proven to be easier to digest than cow milk and the lactose-free segment of dairy is the fastest growing.
- Value-added sheep and goat dairy products can be lucrative, such as infant formula, ice cream, and especially cheese, as confirmed by the consumer survey. Demand for infant formulas made with sheep milk and goat milk powders is rising in Asian countries.
- Market challenges specific to the U.S. include governmental regulations; high operating costs, especially for the use of the country's only milk testing and record keeping organization; transportation costs for processing and distribution; limited available market research; and high costs of production associated with limited sheep breeds in the U.S.
    - High prices limit sales of sheep and goat dairy to specialty stores rather than supermarkets, where most of consumers spend their money on dairy products, according to survey.
- Local producers should capitalize on the "locavore" movement that encourages consumers to purchase food from local, small-scale producers. This marketing is likely to be particularly effective in Vermont and other New England states, based on their proximity to urban centers and affluent consumers. Our consumer survey suggests that those willing to pay premiums for local dairy are willing to pay between 19% and 30% more for locally produced goat or sheep dairy over non-local dairy, depending on the product.

1. Consumer Preference Survey Results

Atlantic conducted a survey of Northeast consumers from New England as well as New York and New Jersey to evaluate consumer preferences and spending of sheep and goat dairy products, specifically cheese, milk, and yogurt. The survey tool can be found in Appendix A, while the methodology of this survey is described in Appendix B.

Respondent Characteristics

A total of 597 consumers completed the survey, 75 from each state, except Vermont, which had 72 completes. Detailed respondent characteristics can be found in Table C1 of Appendix C. Key findings are as follows:

- Respondents slightly skewed female (54.8%), and there were more respondents in the oldest age category of 65+ years than the youngest category of 18-44 years (36.9% compared to 28.6%, respectively).
- The majority of respondents were white, married, had incomes of at least $50,000, and completed at least some college (Figure 1).
- About one-third of respondents were employed full-time, while 38% were retired.
- More respondents indicated living in suburban areas than rural or urban areas.
- The vast majority of respondents (78%) had households of 2+ people that they shopped for, including themselves. About 20% of respondents had children under the age of 18 years living in the home.

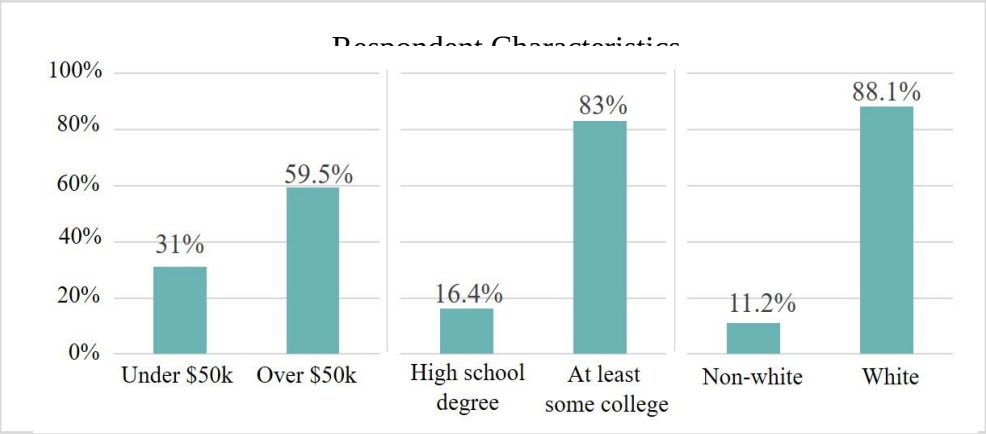

Figure 1. Respondent characteristics: income, education, and race.

Consumption and Spending

By study design, all respondents consumed cheese, milk, and/or yogurt of any type (cow, goat, or sheep) at least once monthly. Consumption regarding each type was assessed, as was spending on general dairy products across several retail channels.

89% of respondents consume cheese.

56% consume goat cheese.

- Cheese had the highest rate of consumption, followed by milk and butter, though rates of ice cream and yogurt consumption were also high (Figure 2).
- Fewer respondents consume sheep and goat dairy products, but over half of respondents reported consuming sheep or goat cheese (Figure 2).
- Consumers indicated making most of their dairy purchases at regional supermarkets, followed distantly by national supermarkets or membership clubs.
- On average, respondents spent $38.00 on cheese, $40.90 on milk, and $41.60 on yogurt per month at regional grocery stores.
- At national and membership clubs, they spent $17.90 per month on cheese, $22.10 on milk, and $16.50 on yogurt.

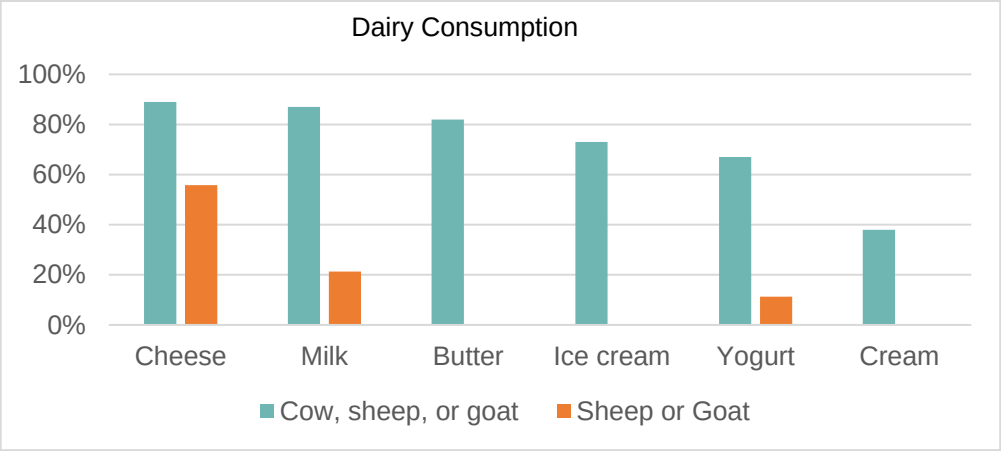

Figure 2. Dairy consumption by product type and dairy type. Only cheese, milk, and yogurt consumption of sheep or goat dairy was assessed.

Consumer Preferences

Preferences for dairy type were assessed by product (cheese, milk, and yogurt). Consumer liking for each product was assessed on a scale of 1 (“Dislike very much”) to 10 (“Like very much”).

- Respondents overwhelmingly preferred cow dairy across all products assessed assuming price and quality are equal (Figure 4).
- Consumers generally favored plant-based alternatives behind cow dairy.
- Only a small fraction of consumers preferred goat or sheep dairy (Figure 4).

- Almost all those who consumed cow dairy products within the past five years indicated that they liked it (scores of 8-10).
- Many of those who tried sheep products indicated they liked them (55-70% depending on the product).
- Respondents appeared to like goat milk the least, with only 44% of those trying the product liking it. Goat cheese and yogurt had higher ratings of liking of 58% and 63%, respectively.

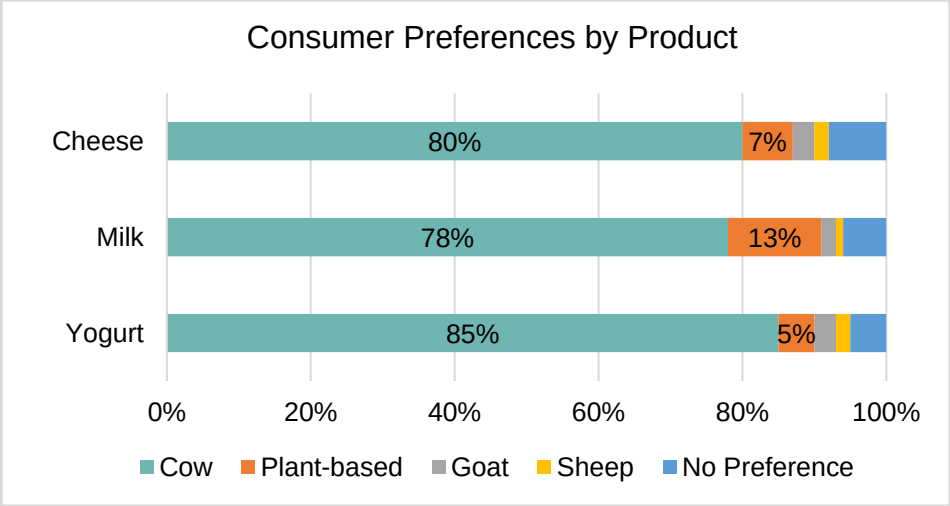

Figure 3. Preferences for dairy type by product (cheese, milk, or yogurt) assuming price and quality are equal.

Willingness to Pay

Willingness to pay was assessed to determine how much more (or less) consumers were willing to pay for sheep or goat dairy products over cow dairy. We also assessed willingness to pay for locally or regionally produced dairy products compared to non-local dairy and organic dairy compared to conventional dairy.

Consumers are willing to pay the highest premiums for local or organic sheep and goat milk.

- Only 7-12% of consumers were willing to pay more for sheep dairy over cow dairy depending on the product, while 9-16% were willing to pay more for goat dairy (Figure 6).
- Those willing to pay more for sheep or goat dairy were willing to pay over 25% more for each product, while those inclined to pay less sought to pay around 40% less than cow dairy products in most cases (Figure 7).
- One-quarter of consumers were willing to pay more for local cow dairy products as compared to non-local. About 9-13% were willing to pay more for local sheep or goat dairy depending on the product.
- Of those willing to pay more for local milk, they were willing to pay an average of 46% more for local cow milk, 29.5% more for local sheep milk, and 27.2% more for local goat milk as

compared to non-locally or regionally produced products.

- Consumers were only willing to pay 19.6% for local sheep cheese and 18.9% for local goat cheese over non-local.
- Trends were similar for organic dairy as compared to conventional. Across all dairy types, consumers were willing to pay the highest premiums for organic milk of all three products. They were willing to pay 35.4% more for organic cow milk, 27.8% for organic sheep milk, and 31.6% for organic goat milk over conventional.

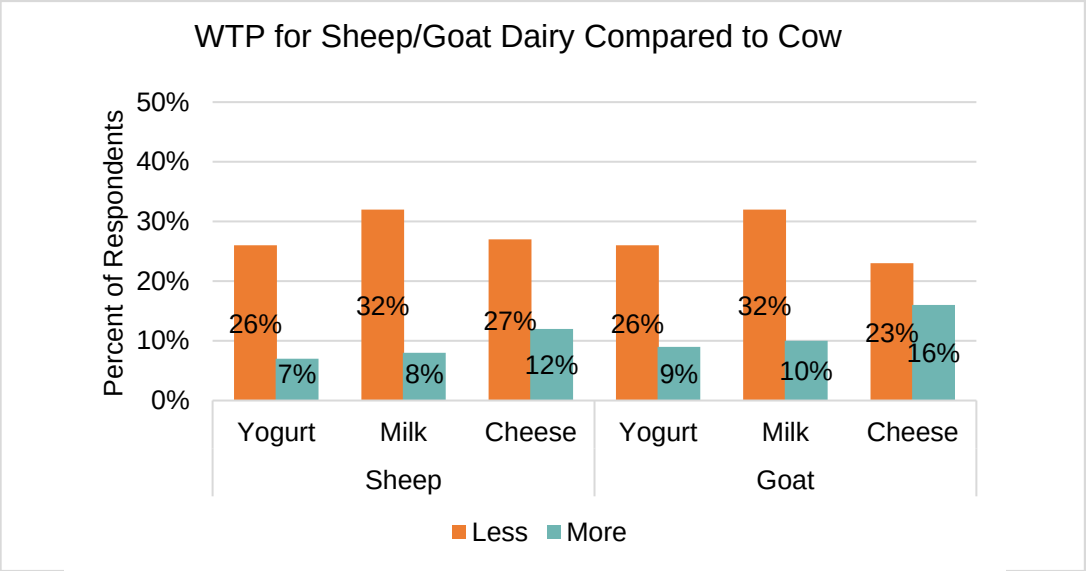

Figure 4. Number of respondents willing to pay more (or less) for sheep or goat dairy as compared to cow dairy.

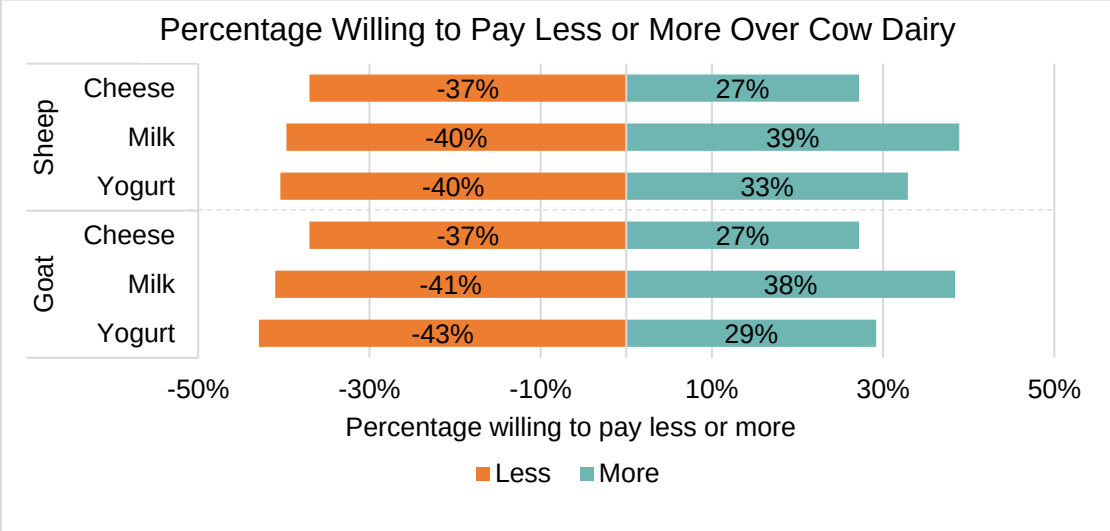

Figure 5. How much more (or less) respondents are willing to pay for sheep or goat dairy compared to cow dairy.

Packaging Preferences

Preferences regarding packaging type and size were assessed for cheese, milk, and yogurt across all dairy types. Key findings are as follows:

- Consumers preferred vacuum-sealed packaging for cheese or had no preference regarding packaging across all dairy types.
- Preferred cheese package size varied by dairy type. About 30% of consumers desired 16-ounce unit sizes for cow cheese, while around 30% desired 8-ounce sizes for sheep and goat cheese (Figure 6).
- Respondents generally prefer white plastic containers for their milk, regardless of the dairy type, followed by clear plastic containers or cartons.
- Only 5% of respondents preferred glass bottles for cow milk, and 9% preferred glass bottles for sheep and goat milk each.
- Respondents were split between preferring gallon or half-gallon sizes for cow milk. Most preferred half-gallon or quart sizes for sheep and goat milk.
- When asked specifically about specialty batch or artisanal milk, respondents preferred smaller sizes (quart or 16-ounce pint) for sheep and goat milk.
- Consumers indicated an overwhelming preference for yogurt packaged in single-serving 5- to 6-ounce cups.
- Over half of all respondents desired white plastic containers for yogurt across all dairy types, while 19% to 25% had no preference regarding packaging type.
- More respondents preferred drinkable containers for goat or sheep yogurt than they did for cow yogurt (11% for sheep, 10% for goat, and 3% for cow).
- Very few respondents preferred squeeze tubes for any dairy type.

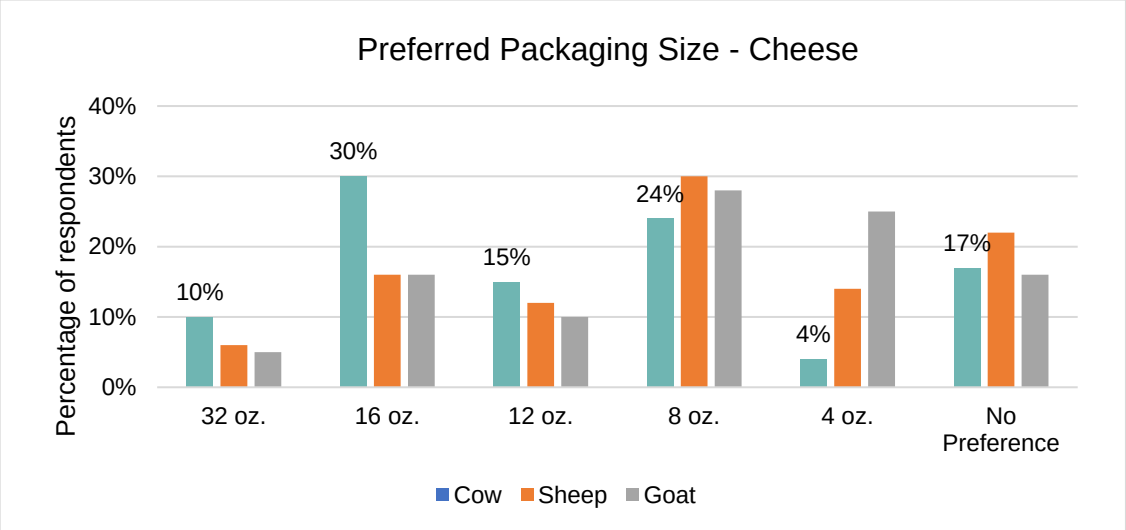

Figure 6. Preferred packaging size for cheese by dairy type (among those who purchase each cheese type)

Other Factors Affecting Purchasing Decisions

Many other factors that could affect purchasing decisions were assessed, including perceived availability, label information, sampling, and familiarity with dairy operations.

- Among those who do not purchase sheep or goat dairy, few believe these products are available for purchase, with the exception of goat cheese.
- About 48% of respondents perceive goat cheese as available. In comparison, 19% believe sheep cheese is available.
- Goat and sheep yogurt were perceived as being least available, with only 4% and 9% of respondents reporting sheep and goat yogurt as being available to purchase, respectively.

Offering samples can improve consumer awareness and help drive sales of sheep and goat dairy products.

- Sampling may help drive sales of sheep and goat dairy products. Among those who have sampled these products in stores, over half indicated they went on to purchase the milk products they sampled, while one-third purchased the cheese they sampled (Figure 7).
- When assessing labels, most respondents indicated that they do not have a preference when it comes to the level of detail regarding geographic origin contained on labels. Although, about one-quarter did prefer to see state-level information on the labels.
- Respondents were generally unfamiliar with the dairy operations that produce the products they purchase, with no more than 25% of respondents familiar with dairy operations producing their cheese, milk, or yogurt products.

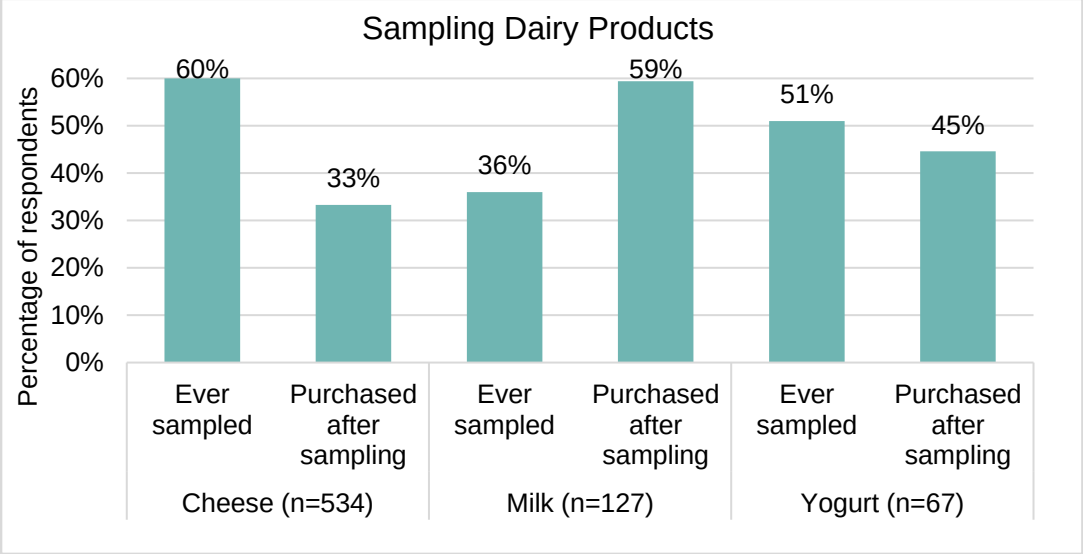

Figure 7. Percentage of respondents that have ever sampled sheep or goat dairy products and the percentage of those who go on to purchase the products after.

2. Demographic Subgroup Analysis

Atlantic assessed differences in spending and preferences across demographics, using t-tests at the 95% level of confidence.

Spending

Average household monthly spending on dairy products at each retail channel varied widely by state. Tables C2-C5, available in Appendix C, describe these results in detail. Key findings are as follows:

- Those in New York, New Jersey, and Massachusetts typically spent more than those in other states on dairy products in general.
- Those in New York spent significantly more on cheese than those in all other states, except for New Jersey, at national retailers/membership clubs and at specialty food markets (Figure 8).
- Those in New York, New Jersey, and Massachusetts spent significantly more on milk than all other states at national retailers/membership clubs and convenience stores.
- Those in New Jersey spent significantly more on yogurt than those in all other states, except New York and Massachusetts, at the following channels: national chains; cooperative or local food grocery stores; convenience stores; farmer's markets and farm stands; and specialty food markets.

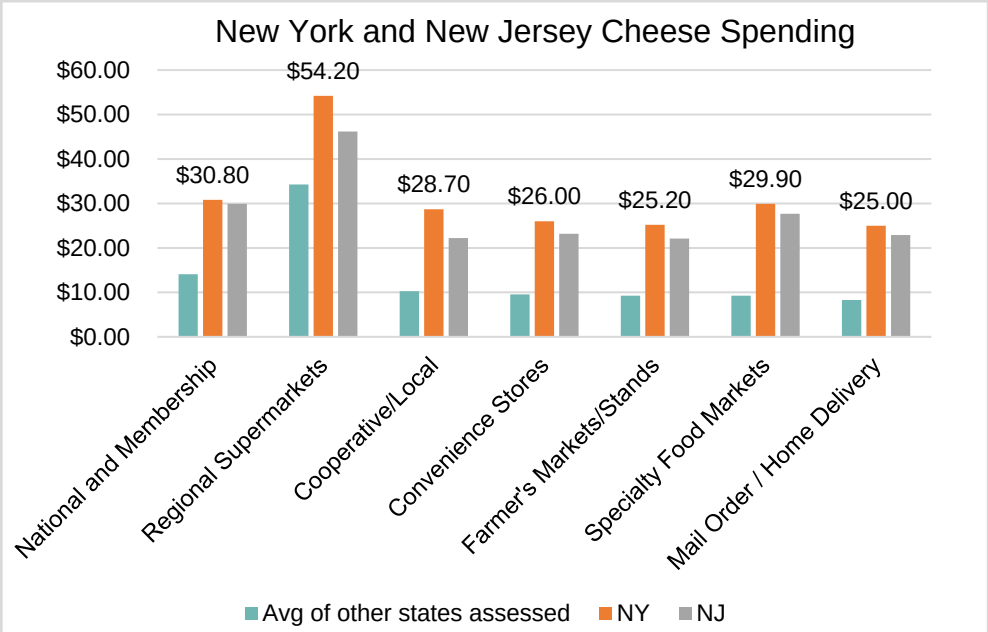

Figure 8. New York and New Jersey cheese spending compared to the average spending of all other states assessed (CT, ME, MA, NH, RI, VT)

We also assessed differences in average monthly spending on cheese at each retail location across age using categories of 18-44 years of age, 45-64, and 65+; income using categories of <$50k (low-income group), $50k-$100k (middle-income group), and >$100k (high-income group); and presence of children under the age of 18 years in the household. Tables C5-C7, available in Appendix C, describe these results in detail. Key findings are as follows:

- Younger respondents spent significantly more on cheese per month than the older age groups across every retail channel.
- Those ages 45-64 years spent significantly more on cheese at convenience stores, farmer's markets/stands, specialty food markets, and mail order/delivery than those 65 or older.
- Those in the high-income group spent significantly more on cheese than those in the middle-income group across every retail location.
- High earners also spent significantly more than the lowest income group at national chains, farmer's markets and farm stands, and specialty food stores.
- Respondents in households with children spent significantly more on cheese on average than those without at every retail channel.
- The youngest age group spent significantly more on milk per month than both the older age groups across all retail channels.
- High earners spent significantly more on milk per month than those in the middle-income group across all retail channels. They also spent significantly more than those in the low-income group at national chains, farmer's markets/stands, and specialty food stores.
- Respondents in households with children spent significantly more on milk than households without children at every retail channel.
    - This variable may drive higher spending seen in the younger age group (18-44 years) as these respondents may be most likely to have young children that have high rates of milk consumption.
- Much like cheese and milk, the youngest respondents, spent significantly more on yogurt per month than the older age groups across all retail channels.
- The highest earners spent significantly more on yogurt than the other age groups at national retailers and membership clubs.
- Respondents in households with children spent significantly more on yogurt than households without children at every retail channel.

Preferences

Preferences for cheese, milk, and yogurt were assessed across demographic subgroups as well. Key findings are described below.

- Older respondents were significantly more likely than the youngest age group (18-44 years) to prefer cow cheese as compared to sheep or goat cheese. Those in the youngest age group were significantly more likely to prefer sheep cheese.
- The highest earners were significantly more likely than the lowest to prefer goat cheese.
- Older respondents were significantly more likely to prefer cow yogurt over sheep and goat yogurt than those in the youngest age group.

- Men were significantly more likely than women to prefer sheep yogurt, although still only a small percentage of consumers preferred sheep yogurt.
- The youngest respondents were significantly more likely than older age groups to prefer sheep yogurt, as were those with children in the household compared to those without.

3. Survey Insights and Recommendations

Increasing awareness of the availability of sheep and goat cheese, milk and yogurt would certainly increase consumption. The most broadly consumed sheep and goat dairy products among respondents was cheese. Yet, among those who reported consuming cheese but not sheep and/or goat cheese, only 19% said they were aware of sheep cheese being available for purchase while 48% said goat cheese is available for purchase. Even lower rates of perceived availability were seen for sheep and goat milk and yogurt. Familiarity of the dairy operations that produce these products is also low. It is likely that increasing consumer awareness of these operations will also increase their perception of sheep and goat dairy availability.

Providing more opportunities for consumers to try sheep and goat dairy products would likely drive increases in consumption. Most cheese, milk and yogurt consumers have never tried the sheep and goat varieties. Respondents overwhelmingly prefer the taste of cow dairy products over sheep and goat; however, this could be due in large part to the lack of consumption of sheep and goat dairy. Of those who purchase goat and sheep dairy, roughly one-third to 60% indicated they have sampled these products. Of those who sampled these products, another one-third to 60% indicated they went on the purchase the products they sampled, depending on the product type.

Grocery stores are the most shopped at channels for dairy, and those like Whole Foods provide good opportunities for sampling of products. Wegmans, which has a very loyal following, also provides samples and covers much of New York and Massachusetts, while Hannaford's, which is known for selling local products, covers most of the region included in the research.

Producers may want to focus on selling sheep and goat cheese, as these products have the highest rates of consumption as compared to milk or yogurt. Target markets to focus on are younger adults (18 to 44) and households with kids under the age of 18 as trial and consumption of sheep and goat dairy products is higher among these segments than their counterparts. General spending on dairy is highest among these groups as well across all retail channels as well.

This study uncovered preferred packaging types and sizes, which can help producers and processors tailor their products to appeal to consumers. Typically, respondents preferred smaller packaging for sheep and goat dairy, including half-gallon or quart sizes for milk, and 8-ounce or 4-ounce packaging for cheese. Even smaller packaging (quarts and pints) were preferred for specialty batch milk products. For yogurt, respondents overwhelmingly preferred five to six-ounce cups for all dairy types.

4. Business to Business Survey

Atlantic conducted a qualitative business to business (B2B) survey of New England-based sheep and goat dairies to map out the most effective sales channels based on first-hand accounts of previous market successes and failures. Through interviews with 26 sheep and goat dairy farms, we assessed trends in pricing and sales across various markets, explored previously profitable distribution methods and successful marketing strategies, and identified current innovative practices. The methodology for this study is described in Appendix D.

Respondent Characteristics

A total of 26 interviews were completed. A list of all respondents can be found in Appendix E.

- Respondents were located within one of four states:
    - Vermont (14)
    - Maine (7)
    - New Hampshire (4)
    - Massachusetts (1)
- Most respondents produce goat dairy (89%) with four of these operations also producing cow dairy. Only two respondents produce sheep milk and two produce soap made from goat milk.
- Most respondents produce cheese (88%) followed by milk (54%) then yogurt (35%) (Figure 9).
- Respondents employed an average of 2.9 employees, including respondents themselves. The smallest operation had only one employee and the largest 10.
- Respondents have been processing dairy for an average of 10.4 years, with the newest business in operation for two years and the oldest in operation for 35 years.
- On average, respondents rated the current performance of their operations as a 5.0 on a 7-point scale, with 1 being extremely unsatisfied and 7 being extremely satisfied.

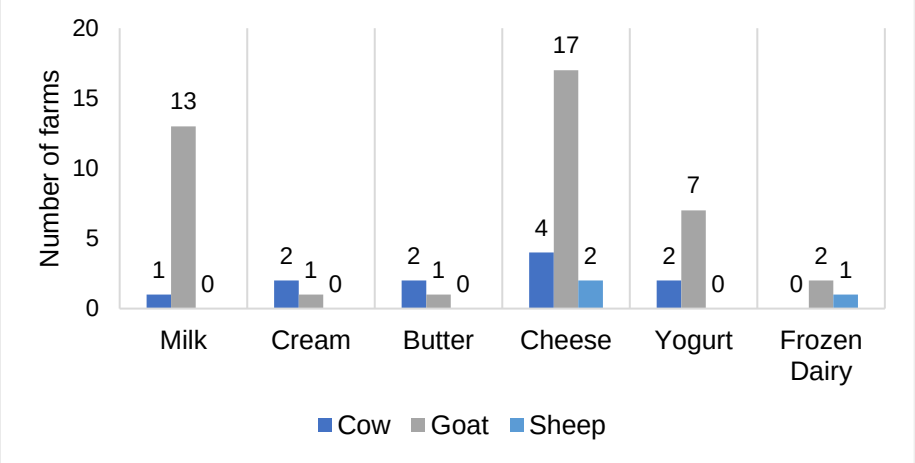

Figure 9. Type of products produced by participating farms

Price Points

The retail and wholesale price points for each product are provided in Tables G1-G3 of Appendix G. Key findings are as follows:

- The average retail price for goat milk was $18 per gallon, ranging from $12 to $32 per gallon.
- The average retail price of goat cheese was $19 per pound, ranging from $9 to $30/lb. Fewer respondents offered wholesale goat cheese, the average price of which was $13.
- Retail prices for goat yogurt ranged from $7 to $20, while prices for sheep yogurt ranged from $40 to $50 per quart.

Distribution Channels

We assessed how and where respondents are currently selling their products as well as where they would like to be selling their products.

- On average, respondents sold more products to rural consumers than urban (61% vs. 39%).
- The most utilized sales channel was retail or wholesale (53% of respondents), followed by farmer's markets (39%) and local grocery stores (8%).
- For those utilizing retail distribution channels, most sell in either their own store or in local natural or artisan food stores, while others sell in regional stores, high-end cheese shops, restaurants, and CSA's.
- Most respondents handle their own distribution. Only 35% of respondents utilize a distribution company, many of which use Provisions International or Farm Connex.
    - Others indicated using Black River Produce, Saxelby Cheese, Pumpkin Village North, and Milk Mavens.
- On average, respondents reported that their products travel about 415 miles from the farm to the point of sale. About half of the respondents sell their product to channels within 100 miles of the farm. One sells globally and one sells to channels 3,000 miles away.
- Ideally, most respondents would like to sell in local markets (92%) as well as markets within their state (69%) and surrounding states (42%) (Figure 10).
    - Local markets are desirable because almost all respondents believed consumers are willing to pay at least 10% more for local products. On average, respondents thought consumers would be willing to pay 35% more.

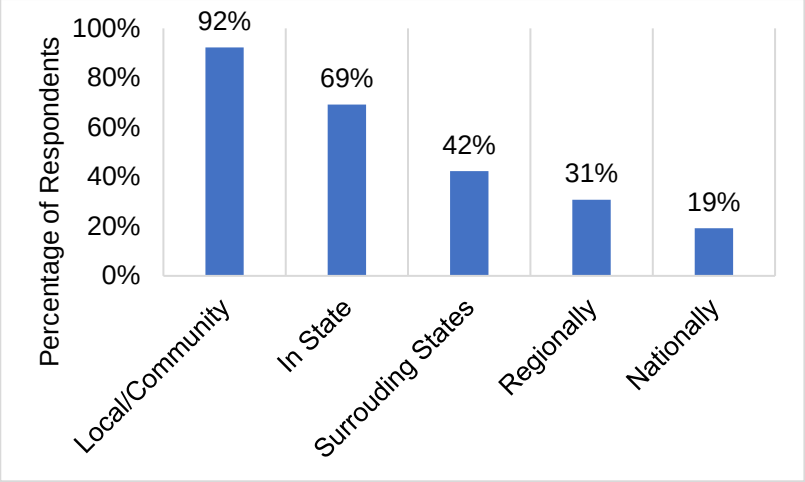

Figure 10. Ideal geographic markets where respondents want their products

Challenges in Distribution

Respondents were asked to provide open-ended answers about the factors that limit distribution. A summary of findings is described below. Detailed participant responses providing more nuance are provided in Table G4 of Appendix G.

- Eight respondents expressed challenges in scaling operations to produce more volume. Given that goats and sheep produce less milk than cows, it can be difficult to meet the demand of local markets, one that most respondents want to participate in.
- Conversely, three farms shared their concern about lack of demand, specifically for goat soap as there is belief the market is oversaturated.
- Seven respondents stated lack of infrastructure as the main growth limiting factor. Several of these farms are in their infancy and are lacking critical components of a solid distribution system such as trucks, storage, and space.
- Farmers are also hesitant to outsource to wholesale distributors due to smaller profit margins. For the smaller farms, it is simply unprofitable.

Strategies to Improve Distribution

Respondents were also asked how they could improve their distribution strategies. Table G5 in Appendix G describes participant responses. Key findings are as follows:

- Many said that more focus needs to be placed on marketing and direct outreach to consumers by implementing more advertisements and more marketing toward stores.
- Improvements to infrastructure and organizational capabilities were on the top of the list for eight farms, which indicated that new delivery trucks and a better supply chain would improve their distribution strategy.
- Farms need expanded access to capital to make these infrastructure improvements.

Innovative Approaches

Respondents were asked about innovative approaches in the processing, packaging, or sales of their products. Table G6 in Appendix G details specific responses.

- Due to the pandemic, some respondents pivoted their sales and marketing strategies to online sales direct to consumer, while others opened farm stands or partners with neighboring farms to establish co-ops (Table 6).
- Many found the best way to differentiate themselves was through creative marketing such as humorous advertisements and the use of social media.
- Three farms noted their approach to packaging. Two use environmentally friendly packaging to appeal to consumers that prioritize sustainability, and another uses bright and colorful packaging as a marketing strategy.

Comments for the NE-DBIC

Respondents were asked to provide information they want the NE-DBIC and the VAAFM to know about producing goat and sheep dairy products. Table G7 in Appendix G details specific responses.

- Respondents cited concerns with lacking infrastructure, high operating costs, and the need for more resources to address these challenges such as investments in small farms, grants, and advertising.
- Many respondents noted the high demand for goat and sheep dairy products and room for growth in the industry. They stated that providing opportunities for consumers to sample products and improving consumer awareness can help farmers achieve this growth.
- Three respondents noted regulations as a barrier to entry among small businesses.
- Two participants mentioned challenges regarding costs of labor and labor shortages.

B2B Insights and Recommendations

This qualitative study was undertaken to explore the most effective sales strategies used by goat and sheep farms in New England. Specifically, we aimed to better understand pricing strategies across various product types and identify themes in distribution successes and challenges as well as current innovative practices.

Our findings showed that most respondents produce cheese. This is likely due to increasing consumer demand for locally-sourced specialty cheese and the premium prices for which consumers are willing to pay. Producers are aware of these growing trends, and local markets were by far the most sought-after geographic market for respondents' products, with many believing that consumers are willing to pay an average of 35% more for locally produced dairy products. Price points varied widely within product categories. More research on sales data and profit margins is necessary to gauge the effectiveness of varying pricing strategies.

Despite the enthusiasm for local markets, entry into these markets is challenging. Most respondents handle their own distribution, and scaling operations to meet the demand of local distribution channels would be difficult given the low milk output of goats and sheep in comparison to cows. High costs of operations are another barrier to expansion, as is the lack of infrastructure and organization in the industry that many farms require to profitably scale and take on a distributor. Nevertheless, farmers insist the demand for goat and sheep milk products is there, and that there is room for growth in the industry, especially if they can improve consumer awareness about the products and their benefits. Consumers are often looking for healthier and easier to digest alternatives to cow milk, and goat and sheep milk products can fill that need.

Goat and sheep farms are still finding success, particularly through creative marketing tactics such as humorous or authentic advertisements, the use of social media, and by offering samples. Many still believe that more marketing is needed, likely to educate consumers about their products. Packaging was another noted tactic, with environmentally friendly and colorful packaging commonly used by respondents.

Respondents were very clear regarding the need for more resources to help goat and sheep farms overcome barriers to scaling operations and becoming more profitable. Some were frustrated about the struggle small farms face and indicated there are many large structural problems within the industry that need to be solved. Some resources that could help are industry-sponsored advertising to help educate consumers about the benefits of goat and sheep milk as well as investments in small farms, particularly grants, which some perceive as difficult to navigate and apply for as small farms.

Based on our findings, we have summarized our recommendations for goat and sheep dairy farms and industry stakeholders as follows:

- Goat and sheep dairy producers may find the most success in local markets, particularly urban ones where consumers are more willing to pay premium prices for local products. Those who sell solely in rural markets should have effective marketing strategies for selling expensive specialty goods to rural consumers less willing to pay for local attributes.
- Current successful marketing strategies include use of humor, social media, authentic marketing, colorful packaging, and highlighting unique characteristics of the farm animals.
- Small goat and sheep farms found success pivoting to new sales and marketing strategies during the pandemic, including new distribution channels such as direct-to-consumer online sales and partnerships with neighboring farms to establish co-ops, making it easy for consumers to shop locally in one place. These strategies may be worth exploring as online food sales and demand for local foods is expected to keep rising even after the pandemic.
- There is room for growth in the sheep and goat dairy industry. More marketing is needed to educate consumers on the benefits of these products; however, additional resources must be directed to small goat and sheep farms to enable them to develop marketing plans. Additionally, goat and sheep dairy industry associations could sponsor advertising to increase consumer awareness of goat and sheep milk products and their benefits.
- State agencies and other agricultural grantmaking organizations should consider adding new programs to support small farms or should better highlight existing programs and provide training opportunities to teach small farmers how to apply for assistance through webinars, easy-to-follow guides, or additional promotion of how to find these resources.

5. Analysis of Global Market Conditions and Context

Atlantic conducted secondary market research of the sheep and goat dairy industry to develop a comprehensive understanding of global and domestic markets, identify key factors that may influence producers' competitiveness, and assess potential avenues to improve market advantage.

We conducted a global review of existing industry and trade research to determine the precise sizing of international markets for sheep and goat milk products, including market statistics, economic insights, a breakdown of industry product segments, key market and industry trends, and analyses shaping the direction of the market. We utilized available data such as market research reports, analyst reports, proprietary business and industry databases, government resources, trade journals, and any pertinent secondary resources to inform the recommended engagement strategy for Vermont and New England-based producers.

Industry Trends

Market projections for goat and sheep dairy show consumer demand will increase significantly worldwide, providing new prospects for dairy producers, including U.S. farms that are poised to embrace opportunities. Global sheep and goat dairy markets are currently valued at about $8 billion each. Research indicates these markets will continue to expand, largely due to consumer demand for dairy alternatives that have high-quality nutritional benefits but are lower in lactose and easy to digest (Canterbury Development Corporation, 2017. Kadam et al., 2019). The global goat dairy market is expected to increase by 42%, reaching $11.4 billion by 2026 (Kadam et al., 2019). Global sheep milk production is expected to increase by approximately 26% by 2030 (FAOSTAT, 2018).

Research conducted by Atlantic shows significant untapped domestic market opportunities, specifically for goat and sheep cheese products. A national survey completed in 2019 assessed preferences for cheese made from either cow, goat, or sheep milk, assuming quality and cost are consistent. Although 72% of respondents selected cheese made from cow milk as a top choice, nearly 2% opted for sheep cheese, and almost 13% expressed a preference for goat cheese. State-based data showed a wide range of preferences for sheep and goat milk cheese, from 1.5% (sheep's milk cheese - Kansas) to 38% (goat's milk cheese - New York) (Atlantic Corporation, 2020).

While the sheep dairy market is comprised mostly of cheese products, the goat dairy market includes a variety of health and beauty products as well as milk, cheese, and milk powder products, with fluid milk the largest global market segment. Factors driving anticipated market growth for sheep milk are similar to those invigorating the goat dairy sector, including an uptick in consumer demand for nutritious, low-cholesterol milk alternatives, new opportunities in the health and beauty sector, and expected population growth in Asia-Pacific countries, where goat milk is a dietary staple (Kadam et al., 2019).

Although most of the world's dairy goat production and consumption occurs in Asia, the industry continues to evolve in the U.S. (Miller and Lu, 2019). According to the Agricultural Census, there are 35,682 U.S.-based dairy goat farms, and total sales topped more than $35 million in 2017 (USDA, 2017). The New England region has 1,570 dairy goat operations, accounting for 4.4% of the total U.S. goat farms, and in 2017 these farms generated $1.8 million in sales.

Among the New England states, Maine has the largest number of farms, at 395, followed by Massachusetts (335), Connecticut (280), Vermont (270), New Hampshire (231), and Rhode Island (59) (USDA, 2017). However, Vermont dairy goat farms generated the most in sales among New England states, bringing in $680,000 in 2017. Dairy goat operations represent about 4% of total farm operations in the state (2017 Census).

Global trends of steady growth in the demand for goat milk products are mirrored in the U.S. In the ten years between 2007 and 2017, the number of U.S.-based dairy goat herds more than doubled and, in fact, outpaced all other major livestock groups in growth (Berry, 2018). USDA Agricultural Census data show the number of milk goat farms grew 21% between 2012 and 2017, with corresponding farm sales growing by 2%.

In addition to increased demand from health-conscious consumers and emerging economies, other trends present sector opportunities and challenges. These include greater public awareness of dairy alternatives, growth in e-commerce sales, more stringent government regulations, availability of government subsidies, recognition of food production's impact on climate, and concerns about food safety.

International Sheep and Goat Dairy Production and Consumption

Global Sheep and Goat Dairy Production

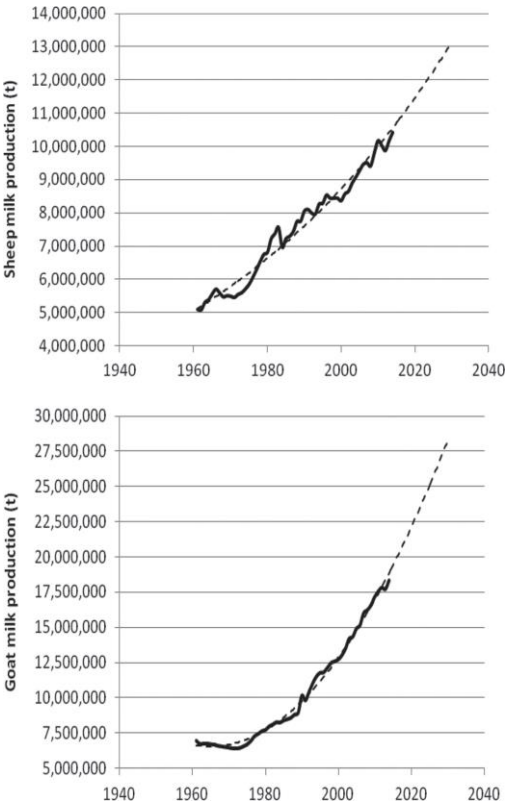

Figure 11. World sheep and goat milk production trends from 1960 to 2016 (solid line) and forecast to 2030 using time-series model (dashed line). (Source: Pulina et al.. 2018. FAOSTAT 2018.)

In 2016, dairy sheep and goats produced approximately 3.5% of the world's milk. Cattle and buffaloes are the most important milk producers globally, accounting for 83.1% and 13.1% of the world's milk production, respectively. Sheep milk made up only 1.3% of the world's total milk production, and goat milk was only slightly higher, at 1.9%. Sheep and goat milk remain a small part of the world's total milk production, but both industries are growing. In the last 50 years, worldwide sheep and goat milk production has more than doubled. If this trend continues, sheep milk production is expected to increase by 26% and goat milk production by 53% by 2030 (Figure 11) (FAOSTAT, 2018). The world dairy goat population increased by almost 22% between 2007 to 2017 (FAO, 2019). The current global dairy goat population is estimated at 203 million goats. There are an estimated 250 million dairy sheep in the world (FAOSTAT, 2018).

The majority of the world's dairy sheep and goats are located in subtropical-temperate areas of Asia, Europe, and Africa. Dairy sheep are primarily found in the Mediterranean and Black Sea regions, while dairy goats are concentrated in the Indian subcontinent's low-income countries. Dairy goats can also be found in high-income, technologically developed countries worldwide, such as France and Spain (Pulina et al., 2018).

Global Goat Milk Production

Asia produces most of the world's goat milk (57%), followed by Africa (24%) (Figure 12) (Lu and Miller, 2019). Indian subcontinent countries, including Indian, Bangladesh, and Pakistan, produce 40.7% of the world's goat milk. China produces almost 2% of the world's goat milk and is rapidly increasing production.

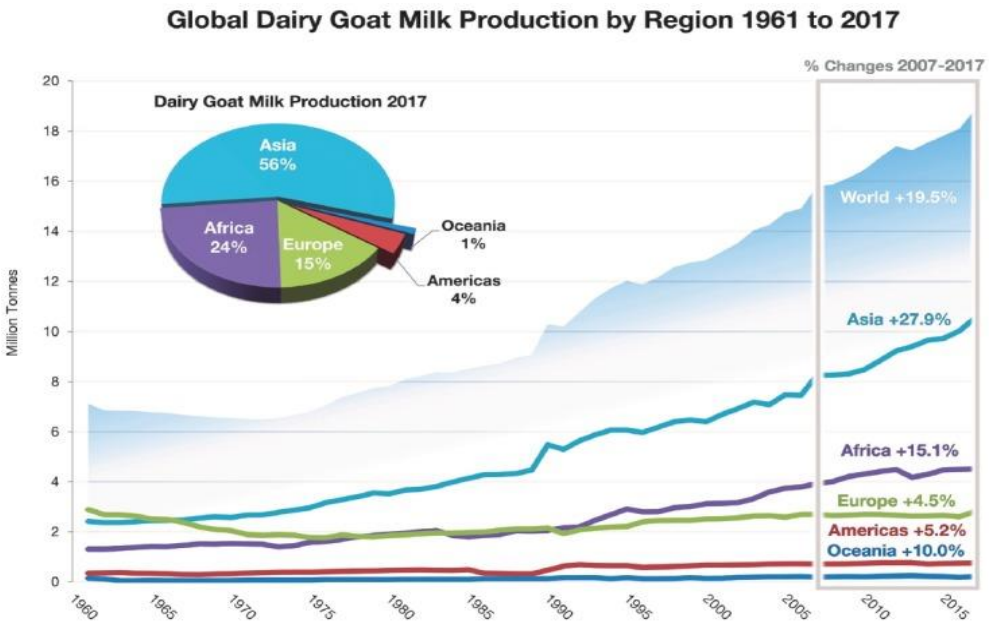

Figure 12. Global trends of goat milk production (Tonnes) from 1961 to 2017. From Miller and Lu 2019.

In Africa, Sudan and South Sudan are the most important milk producers (Pulina et al., 2018). The goat milk industry in Europe is more specialized and commercialized than in any other part of the world, allowing the region to produce 15% of the world's total goat milk with only 5% of the population (FAO, 2019).

The Western Hemisphere is not considered a significant producer of goat milk and contributed only 4.4% of global goat milk production during 2006 through 2017 (FAO, 2019. Lu and Miller, 2019). Mexico and Brazil are the primary dairy goat-producing countries in the Americas due to small-scale production and local consumption. Comparatively, the U.S. and Canada have fewer dairy goats but rapidly commercializing industries. In the ten years between 2007 and 2017, production increased by 4.9% in the Americas while the dairy goat population decreased overall by 0.7%, indicating productivity improvement with increased commercialization (Lu and Miller, 2019).

Global Sheep Milk Production

The majority of the world's sheep milk is produced in Asia (45.6%), mostly in China and Turkey. Europe produces 29.0% of the world's sheep milk, followed by Africa (24.5%). Production is minimal but growing in the North and South Americas (0.9%) and Oceania (<0.1%) (FAOSTAT, 2018). In Europe, France and Spain lead the sheep milk production market, and in combination with Greece and Italy, produce 45.8% of the total sheep milk from the Mediterranean and Black Sea regions and 12.9% of the world's sheep milk (FAOSTAT, 2018., Elischer, 2017). In the United States, there are approximately 100 commercial sheep dairies, primarily concentrated in the upper Midwest and New England states, with a few found as far west as California (Elischer, 2017).

U.S. Sheep and Goat Dairy Production

The goat and sheep milk industries in the U.S. have been historically insignificant compared to the country's cow dairy industry. Today, goat and sheep milk represent approximately 0.08% of the total annual milk production in the U.S. (Milani and Wendorff, 2011). Approximately 75% of the goat milk

and 95% of the sheep milk produced in the U.S. are used to produce cheeses (Milani and Wendorff, 2011). Although the industries remain small, the U.S. goat and sheep dairy industries are seeing significant growth. Dairy goat numbers in the U.S. doubled between 1997 and 2012 (Lu and Miller, 2019). In fact, dairy goat herds grew more quickly than any other major livestock group between 2007 and 2017, a ten-year period during which their size increased by 61%.

The U.S. Department of Agriculture's latest Census of Agriculture found that dairy goat herds grew in all 48 states for which there was data. The most significant increases in dairy herd size were found in Wisconsin, Iowa, and Texas, the nation's three biggest goat dairy states (Reiley and Van Dam, 2019). As of 2018, there were 2.6 million goats in the United States, approximately 380,000 (16%) of which are thought to be raised primarily as dairy animals. Wisconsin, California, Iowa, Texas, and Pennsylvania are the states with the highest number of dairy goats. These states are also in the list of top 12 states for dairy cows, indicating that dairy goat production benefits from well-developed cow dairy industries in the U.S. (Lu and Miller, 2019).

The Vermont dairy goat industry is the most successful in the New England States and has also seen significant growth over the last several years. The number of milk goats in Vermont nearly quadrupled from 1997 to 2017, and sheep and goat milk sales increased 24% from 2012 to 2017. Sheep and goat milk sales in Vermont were valued at $4.2 million in 2017. The state's industry is also seeing a considerable opportunity for growth. Vermont Creamery, a nationally renowned cheese company, is unable to meet its need for goat milk and must source additional milk from Canada. The company hopes to establish ten new Vermont goat dairies at 400 goats each over the next five years, increasing the state's milk goat industry by 50% (KarenKarp & Partners, 2020).

The U.S. sheep dairy industry is less developed than the goat dairy industry in the country. The U.S. had almost no dairy sheep until the early 1990s (Fletcher, 2016). Today, the U.S. dairy sheep industry remains small, despite the high demand for sheep-milk cheeses (Pulina et al., 2018). U.S. sheep milk production is estimated at approximately 9.4 million pounds, or almost two million pounds of domestic cheese. The U.S. imports between 28 to 38 times more cheese than it produces, suggesting considerable room for market growth within the country (Brown, 2017). There are already signs of growth. From 2010 to 2016, the number of entries made from sheep's milk in the American Cheese Society competition grew by 40% (Fletcher, 2016).

Global Consumption

Goat milk is the number one consumed milk globally, with an estimated 65% of the world population consuming goat milk (Berry, 2018). The majority of goat milk is consumed in India, Bangladesh, Pakistan, and Turkey, where milk is used for home consumption and kept by small-scale producers. Goat milk is also an important food source in the Mediterranean, Middle East, Eastern Europe, and parts of South America (Miller and Lu, 2019). There is little data available on sheep milk consumption rates for specific regions. However, based on production locations, we can infer that much of the world's sheep milk is consumed in Asia and Europe (Pulina et al., 2018).

U.S. Consumption

The U.S. loves dairy, which currently accounts for 15% of fresh food sales, 16% of packaged food sales, and 15% of organic food sales. The Milk Processor Education Program manages large milk campaigns that help maintain the demand for dairy products in the country (Canterbury Development Corporation, 2017). Although cow milk remains dominant in the U.S., the consumption of goat and sheep milk products is growing. North America is considered the second largest market for goat dairy products in the world, with the U.S. leading the market in the region (Research and Markets, 2020). The U.S. also is a leader in the world market for sheep cheese imports, accounting for 41%

of the total amount of sheep cheese imports globally, or an estimated 53 to 73 million pounds of sheep cheese (Brown, 2017, FAOSTAT, 2018).

Key Market Players

Goat Milk Industry

Key players in the market as identified by Allied Market Research in their Global Goat Milk Market Research Report include a variety of companies within two broad categories: 1) large-scale manufacturers and distributors specializing in global trade and market development (food and beverage companies; and 2) top supplying multi-generational family farms that sell goat milk and other goat dairy products (Kadam et al., 2019). Top goat milk food and beverage companies are described in Table 5, while the top supplying farms are described in Table 6.

Table 5. **Top Goat Milk Food and Beverage Companies**

Company	Location
Ausnutria Dairy Corporation Ltd.	China
AVH Dairy Trade B.V.	Netherlands
Goat Partners International	U.S.
Granarolo S.p.A.	Italy
Stickney Hill Dairy Inc.	U.S.
Baiyue Dairy Group	China
Xi'an Baiyue Goat Dairy Group Co.Ltd.	China
FIT Company in France	France
Holle baby food A.G.	Switzerland
Yayi International	China

Table 6. **Top Goat Milk Supplying Farms**

Company	Location
Meyenberg Goat Milk	China
Redwood Hill Farm & Creamery	U.S.
St Helen's Farm	U.K.
Woolwich Goat Dairy Inc	Canada
Hay Dairies Pte Ltd.	Singapore
The Good Goat Milk Co.	New Zealand
Summerhill Goat Dairy	U.K.
Cherry Glen Goat Cheese Co.	U.S.
Delamere Dairy	U.K.

Sheep Milk Industry

The key players in the market as identified by MarketWatch in their Global Sheep Milk Market Research Report include a variety of companies within two broad categories: 1) large-scale manufacturers and distributors specializing in global trade and market development (food and beverage companies); and 2) top supplying multi-generational family farms that sell goat milk and other goat dairy products (MarketWatch, 2020). Top goat milk food and beverage companies are described in Table 7, while the top supplying farms are described in Table 8.

Table 7. **Top Sheep Milk Food and Beverage Companies**

Company	Location
New Zealand Sheep Milk Company	New Zealand
Spring Sheep	New Zealand
Alimenta s.r.l.	Italy

Table 8. Top Sheep Milk Supplying Farms

Company	Location
Velvet Cloud	Ireland
Origin Earth Ltd.	New Zealand
The Sheep Milk Company Ltd.	U.K.
Haverton Hill Creamery	U.S.
Roquefort Vernieres	France
The Good Goat Milk Co.	New Zealand
Summerhill Goat Dairy	U.K.
Cherry Glen Goat Cheese Co.	U.S.
Delamere Dairy	U.K.
Dairy Goat Co-operation	New Zeland

Industry Product Segments

The product segments are similar for the goat and sheep dairy markets; however, there are more segments for sheep dairy than goat dairy, while goat dairy consists of more sub-segments. These are described in Table 9.

Table 9. Goat and Sheep Dairy Product Segments

Goat Dairy Product Segments and Subsegments (Arizton Advisory and Intelligence)	Sheep Dairy Product Segments (MarketWatch)

- Packaged Milk
  ○ Skim
  ○ Whole
  ○ UHT
  ○ Other
- Milk Powder
  ○ Skim
  ○ Whole
- Cheese
  ○ Chevre
  ○ Mozzarella
  ○ Cheddar
  ○ Feta
  ○ Others
- Other
	- Fluid milk
	- Milk powder
	- Cheese
	- Butter
	- Yogurt
	- Ice Cream
	- Other

Trade Flows and Anticipated Growth

Goat Milk

The majority of goat milk produced in the world is used for direct consumption, although global markets for goat milk are rapidly developing. The goat milk market in the Asia-Pacific region is projected to grow at the fastest compound annual growth rate between 2020 and 2025. North America is predicted to experience the highest incremental growth. Rapidly growing markets in Brazil, Argentina, Peru, India, and Turkey are all expected to improve overall market growth (Research and Markets, 2020). Goat milk markets are driven by different products based on the region. In France, Greece, Italy, and Spain (FGIS), most goat milk is used for cheese production, although the consumption of whole milk and yogurt is also common. Goat milk is considered a part of the historical "Mediterranean Diet" and is culturally significant in the area. Data on the international

trade of goat cheese is not available, but it is significant to note that almost 50% of Protected Designation of Origin (PDO) goat cheeses are produced in Spain and exported worldwide (Pulina et al., 2018). France is also often associated with high-quality goat cheese, although Italy and the United States both produce it. In fact, goat cheese is recognized as the most popular goat milk product in the North American market. In 2019, fresh goat cheese contributed approximately 38% to the global milk market revenue (Research and Markets, 2020).

In China, goat milk is used to make milk powder (Pulina et al., 2018), which, along with goat whey, is used to manufacture baby formulas (Miller and Lu, 2019). Most of China's goat whey is imported from Italy and the Netherlands (Li, 2019). The use of goat milk powder in infant nutritional formulas is driving the expansion of the dairy goat industry in China, which has seen significant growth, especially in Shaanxi, Shandong, and Henan provinces (Miller and Lu, 2019).

Sheep Milk

The majority of sheep milk produced in the world is processed into cheese (Ospanov, 2020). In 2013, global exports of sheep-milk cheese valued at approximately $374 million. FGIS process more than 90% of their sheep milk as cheese and much of the rest as yogurt. FGIS sheep milk production is characterized by specialized dairy breeds, large commercial processing plants, and advanced technology. These characteristics help support the market for PDO sheep-milk cheeses recognized by the European Union. PDO sheep-milk cheeses are significant to the international cheese trade and have a growing international market (Pulina et al., 2018). Italy is the leader in sheep-milk cheese exports, holding 36% of the market share, followed by France (20%) (FAOSTAT, 2018).

The United States and Germany are the leading importers of sheep-milk cheese, accounting for 42% and 41%, respectively, of all sheep cheese imports (FAOSTAT, 2018). The majority of cheeses imported by the United States and labeled as PDO sheep cheese come from Italy, but significant imports also come from Spain, Greece, France, and Bulgaria (USDA-FAS, 2016).

Although little data is available on Chinese sheep dairy production, the sheep milk industry is growing in the country, likely driven by the use of sheep milk in infant formulas. Otherwise, sheep milk in China is primarily used for home consumption and the production of organic milk. China works with New Zealand companies to produce infant formulas (Pulina et al., 2018).

Current Market Conditions

Global Market Conditions

The global goat milk market size was valued at $8.5 billion in 2018 and is expected to reach $11.4 billion by 2026, growing at a compound annual growth rate (CAGR) of 3.8% from 2019 to 2026. Today, the majority of goat milk produced globally is used for direct consumption. The remaining milk is used for cheese production, followed by milk powder and other products. Allied Market Research predicts the milk powder segment will exhibit the highest CAGR of 7.4% during the forecasted time period between 2019 and 2026 (Figure 13) (Kadam et al., 2019).

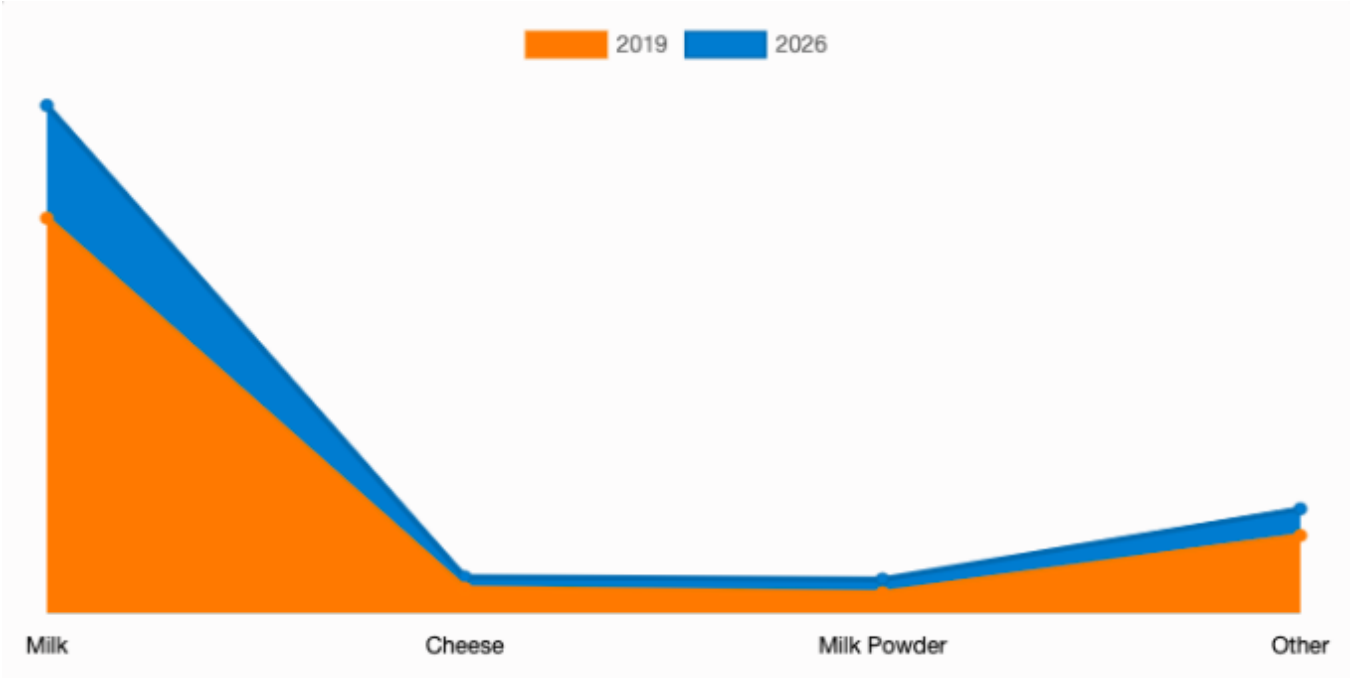

Figure 13. Global goat milk market growth by product from Allied Market Research's Global Goat Milk Market Research Report. From Kadam et al. 2019.

The anticipated growth in the goat milk powder market segment is likely due to the increased use of goat milk in infant formulas (Research and Markets, 2020). Goat milk is easy for infants to digest and has similar nutritional properties to human milk (Kadam et al., 2019). Sheep milk is also being increasingly used in infant formulas. For example, there is a high demand for sheep milk infant formula in Taiwan (Canterbury Development Corporation, 2017).

In addition to milk powder, nutraceutical products containing goat and sheep milk are likely to do increasingly well in the global market. The nutraceuticals market is expected to grow at a compound rate of 7.3% for the next five years, achieving annual sales exceeding $279 billion (Canterbury Development Corporation, 2017). Goat and sheep milk are increasingly used in nutraceutical products, which are expected to drive overall market growth (Kadam et al., 2019. Canterbury Development Corporation, 2017).

Other trends driving growth in the global sheep and goat milk markets include:

- *Population Growth and Emerging Economies:* Population and economic growth drive the goat milk market growth in Asia-Pacific (Kadam et al., 2019). Similarly, changing consumer demographics drive region-based market growth. For example, Mexican, African, and Middle Eastern immigrants who prefer goat milk drive demand in the U.S. (Miller and Lu, 2019).

- *Government Subsidies:* Government subsidies drive global market growth in the goat dairy industry. India's government provides 25-30% subsidy on the total cost of goat farms and the E.U. provides allowances for maintenance of goat farms (Kadam et al., 2019).
- *Technological Development:* The quality of goat and sheep dairy products, along with their shelf lives, are improving because of technological innovations in dairy processing equipment. Additionally, improvement in chillers and cold chain logistics for products like yogurt and fresh milk have increased their availability, and in turn, boosted demand. Technological innovation drives product freshness, essential to the growth of these dairy products (Research and Markets, 2020).
- *Convenience Trends:* Consumers live busier lives than ever before, and in turn, are often seeking out products for their convenience. Snack and single-serving options are among the fastest-growing food and beverage market segments (Berry, 2018). This may result in fresh products, like milk and yogurt, being preferred over milk powder in certain regions (Canterbury Development Corporation, 2017).
- *Health and Wellness:* Across the globe, an increasing number of consumers are becoming more health-conscious and are willing to pay a premium for products that provide health benefits (Canterbury Development Corporation, 2017).
    - Goat milk is a rich source of protein, calcium, fats, vitamins, and iron and has a low cholesterol level. It has been shown to help improve platelet count for people experiencing viral diseases such as Dengue fever. Additionally, the similarities between goat milk and human milk make it a plentiful source of energy for infants (Kadam et al., 2019).
    - Sheep milk is also vitamin and nutrient-rich, with higher levels of the essential vitamins A, D, E, and C compared to both goat and cow's milk. Sheep milk has a higher protein content and 50% more iron than both goat and cow milk (Canterbury Development Corporation, 2017).
- *Dairy Alternatives:* The population of people with a lactose-intolerance is growing, driving demand for cow milk alternatives, especially in Asian markets (PRNewswire, 2020). Both goat and sheep milk have lower lactose levels than cow milk and are considered easier to digest (Canterbury Development Corporation, 2017). Over 3% of children have a cow milk allergy, which can cause digestive issues and skin problems (Reiley and Van Dam, 2019). Goat milk is considered less allergenic than cow milk and as cow milk allergies increase, consumers will seek dairy alternatives and drive market growth for goat milk (Berry, 2018).
- *Storied Products:* Consumers seek out storied products and drive significant market growth in 'craft' industries, such as craft beer. Goat and sheep dairy products are expected to benefit from this overall market trend (Canterbury Development Corporation, 2017).

U.S. Current Market Conditions

The U.S. market for goat and sheep dairy products is growing, driven by the many global trends previously described. The obesity crisis in the U.S. is driving consumers to find healthier, lower-fat products (Canterbury Development Corporation, 2017). Lactose-intolerance is becoming more common, further driving the expansion of cow dairy alternatives (Research and Markets, 2020).

Cheeses produced with sheep and goat milk are particularly popular as cow dairy alternatives in the U.S. (Berry, 2018). Goat cheese is the most popular product in the North American goat milk product

market (Miller and Lu, 2019. Research and Markets, 2020). This finding was demonstrated in our consumer survey. Demand for specialty cheeses, including those made from sheep milk, is expected to continue growing. (Canterbury Development Corporation, 2017). Additional trends driving growth in the goat and sheep milk industries in the U.S. include changing population demographics, local and organic food movements, innovative products, and baby food, as described below:

- *Changing Population Demographics:* U.S. demographics are changing rapidly, driving shifts in the food and beverage industry. The Hispanic and Asian-American populations in the country, who have high lactose-intolerance rates, are growing faster than the total U.S. population (Canterbury Development Corporation, 2017). Immigrant populations from Mexico, Asia, Africa, and the Middle East are growing, further increasing the demand for goat and sheep milk products more common in those regions (Lu and Miller, 2019).
- *Local and Organic Foods Movements:* The organic dairy goat industry in the U.S. is growing in conjunction with the increasing demand for organic products in the country. Additionally, many goat farms in the U.S. are located near major metropolitan areas where affluent consumers are seeking organic and local goods and are willing to pay a premium for those products (Lu and Miller, 2019). Goat and sheep dairy producers that capitalize on growing demand for local and organic foods may see significant growth in coming years.
- *Innovative Products* U.S. sheep and goat dairy products already receive recognition on the global market for their quality. U.S. goat cheeses have received multiple gold medals at international cheese competitions, which helps attract new consumers to the market (USDA, 2011). Producers are working to develop innovative products. For example, Vermont Creamery in Vermont released three new goat cheese varieties that were created using on-trend flavors such as honey, pepper jelly, and blueberry lemon and thyme. Other producers are developing more convenient products. LaClare Family Creamery in Wisconsin has offers sliced goat cheeses, while FrieslandCampina in New Jersey released goat cheese slices in easy peel-and reseal packaging (Berry, 2018). Innovation within the U.S. market helps producers succeed both within the country and on the global stage.
- *Baby Foods:* Goat and sheep milk are being used more commonly in infant formulas and baby foods worldwide. In the U.S., the scarcity of paid maternity leave forces mothers to stop breastfeeding early, creating a high demand for infant formulas in the country. Milk formula sales are predicted to increase in the U.S. during the next five years, presenting an opportunity for sheep and goat milk producers to expand into this growing domestic market (Canterbury Development Corporation, 2017).

Global Trade and Service Gap Analysis

Despite significant market growth for both goat and sheep milk products, there remains challenges and gaps in domestic and international trade potential. This section describes these difficulties as they relate to corruption, international laws, logistics, and seasonality among others.

- *Corruption:* The appeal of international markets can be severely impacted by government corruption due to the resulting operating and financial risks. For example, high corruption levels in Vietnam are a significant factor in market potential compared to somewhere like Singapore (Canterbury Development Corporation, 2017).
- *International Laws:* Varying food and beverage laws between countries may limit producers' abilities to export to certain countries. In Taiwan, for example, sheep milk may exceed the regulated trans-fat levels in the country because of its high-fat content. Additionally, local

competitors can work with their governments to impose non-trade/tariff barriers on offshore companies. This is possible in Asian food and beverage markets and can significantly impact distribution and import logistics (Canterbury Development Corporation, 2017).

- *Logistics:* Physically exporting raw milk presents logistical challenges and can limit possible export destinations. The challenges associated with raw milk must be considered during both processing and transportation. Countries requiring fresh milk over milk powder can make the cost of exportation too high to be viable. In general, short life shelf products create market and trade challenges. Developing air freight technology increases the viability of specific markets, such as the transportation of fresh milk to value markets in Greater China (Canterbury Development Corporation, 2017).
- *Seasonality:* Goats can only be milked seasonally, which can create a surplus of goat's milk during the summer and a shortage in the winter. Trade and business models must be built to support seasonal production fluctuations. Producers can work as a co-op or choose products with different cycles and shelf lives (Reiley and Van Dam, 2019).
- *Online Distribution:* Online distribution is an increasingly important sales channel for goat and sheep milk products, including both nutraceuticals and fresh products like ice cream, yogurt, and fresh milk. Emphasis on online distribution is disrupting traditional exports and sale processes to Asian markets like Singapore and Taiwan through increased competition and higher product transparency. Producers looking to enter the online distribution market must ensure that the quality of their product and relevant marketing meets the standards and needs of the regional market they are looking to enter.

U.S. Market Challenges

U.S. sheep and goat milk producers face additional challenges to those described above to maximize their market potential on a domestic and global scale.

- *Limited Data:* The U.S. does not have an accurate estimate of the country's total number of dairy goats. The National Agricultural Statistics Service conducted the first-ever full-scale goat survey in January 2005. Without data, it is difficult for producers to understand the current market potential (Animal and Plant Health Inspection Service, 2004).
- *Government Regulations:* U.S. regulations for the production, processing, and marketing of milk were originally designed for cow dairy, which created challenges for goat milk producers. In 2006, "Guidelines for the Production and Regulation of Quality Dairy Goat Milk" were published, creating a legal framework under which the U.S. goat dairy industry could develop. In 2009, the minimum somatic cell count for "grade A" (highest quality) goat milk was established, allowing producers to sell products that command the maximum price. The implementation of universal standards is critical to expanding goat dairy products in the U.S. and building consumer trust for product safety (Lu and Miller, 2019).
- *Operation Costs:* Recording and using production data to improve dairy goat management distinguishes modern dairy goat farming from traditional methods. In the U.S., the Dairy Herd Improvement Association (DHIA) manages milk testing and record keeping. The cost of using the DHIA's services is prohibitive for some producers. Unlike many European countries, there are no government subsidies or programs to offset the cost of milk testing for producers and there is little government support for the U.S. goat dairy industry in general. Despite high costs, the use of DHIA has increased from less than 1% in 2004 to 13% of U.S. dairy goat herds in 2012 (Lu and Miller, 2019).

- *Transportation Costs:* Many small U.S. goat farms sell their milk locally because of high transportation costs or process the milk into artisanal cheese or goat milk soap. Large goat farms in the U.S. are found near goat milk processing plants to limit transportation costs (Lu and Miller, 2019).
- *An Immature Industry:* The U.S. sheep and goat milk industries are significantly less mature than the cow dairy industry. To improve the commercial viability and reach larger markets, these industries need to improve their herd management, feeding techniques, artificial insemination practices, and marketing practices (Lu and Miller, 2019).
- *Lack of Research and Veterinarians:* Due to the immaturity of the goat and sheep milk industries, there is limited research to support market growth. Budget cuts closed North America's only dairy-sheep research program, at the University of Wisconsin-Madison, in 2016 (Fletcher, 2016). Dairy goats' status as a minor use species in the U.S. limits the medical support producers can receive for their herds. There are few animal scientists or veterinarians in the U.S. trained to treat goats, and only 15 drugs labeled for goats, most of which cannot be used on lactating animals (Boyer, 2012. Lu and Miller, 2019).
- *High Prices:* There are few sheep dairy breeds in the U.S., limiting sheep milk production. Without sheep specialized for milk production, it is difficult for U.S. producers to compete with European prices. Wisconsin sheep farmer Laurel Kieffer reported that "A distributor can import manchego for maybe a third of what it costs us to produce," because of the advanced milk production systems in Europe. European sheep-cheese producers commonly have lower land and labor costs and benefit from the decades of breed research and improvement that come with a mature industry (Fletcher, 2016). The high prices of U.S. sheep cheese limit domestic sales to specialty stores rather than supermarkets and often cause consumers to choose lower-priced options like goat cheese (Brown, 2017. Fletcher, 2016). The U.S. must invest in industry development to make domestic sheep milk products more competitive in the global market.

Opportunities for Growth

Small ruminant dairy farmers across the United States recognize the industry is undergoing tremendous change, and the same holds true in Vermont, the state leading New England goat dairy sales. Farms face multiple challenges related to lack of consumer knowledge, uncertain pricing, and increasing regulation, as well as incentives to adopt new technology, develop new products, and cultivate unique brands. The demand for goat and sheep dairy products has seen a steady rise, which adds additional pressure on farms to evolve quickly to meet the needs of growing markets. There are several marketing strategies and areas of opportunity the industry can focus on to help farmers capture this market share.

- *Health Benefits:* As health awareness is rising, research continues to back the health claims of goat and sheep milk, which producers can capitalize on to market their products.
    - Consumer awareness of the importance of protein is growing and consumers are increasingly willing to pay a premium for high-protein foods and beverages (Henchion et al. 2017; Ismail et al. 2020). Producers should capitalize on this trend both in production and marketing. Millennial consumers are likely to be particularly interested in protein-rich products (Wunsch 2020b).
    - Goat milk, compared to cow milk, has a greater composition of important amino acids, calcium, phosphorous, potassium, magnesium, Vitamin A, and oligosaccharides with

beneficial prebiotic and anti-infection characteristics (Ranadheera et al. 2019).

  - Sheep milk is high in fatty acids, immunoglobulins, proteins, hormones, vitamins and minerals (Flis and Molik 2021; Mohapatra, Shinde, and Singh 2019).
  - Goat and sheep milk products can be marketed as products with significant dietary value to help capture a share of the growing market for wellness products. A recent study of 7,500 consumers in six countries found that 79% of respondents believe wellness is important. Better nutrition is a key component of wellness to consumers (Callaghan et al. 2021).
  - The composition of sheep and goat milk makes them effective competitors in the dairy alternatives market, as these products are easier to digest and have lower allergenic potential than cow dairy (Verruck, Dantas, and Prudencio 2019; Turkmen 2017; Balthazar et al. 2017). The market for lactose-free products is the fastest growing segment of the dairy industry, indicating considerable consumer demand for products with minimal lactose (Dekker, Koenders, and Bruins 2019).
  - To capitalize on this market, producers must tailor their marketing to ensure consumers recognize and understand the composition differences between goat and sheep milk and other dairy products.

- *Value-added products:* Value-added products can increase the value of goat milk. Research suggests significant opportunities, such as infant formula, ice cream, yogurt, cheese, and nutraceutical products. U.S. and Vermont producers can capitalize on this opportunity by delivering niche, premium products to specific target consumer groups.
  - For example, goat milk powder is a popular ingredient for infant formulas, the U.S. market for which is expected to grow at a compound annual growth rate of 8.3% between 2018 and 2026 (Fortune Business Insights 2019; FnF Research 2021).
  - There are opportunities to develop nutraceutical and health products made from sheep milk. Nutraceutical and health products are a growing market in which products can command higher margins (Grand View Research 2020a; Teoh et al. 2021). To maintain higher price margins on relevant products, producers should consider using natural health or food stores for distribution. Consumers are likely to understand price differentials between products in stores that are known for having higher prices. Whole Foods Market prices, for example, have historically been 10-20% higher than other traditional retailers (Maverick 2020).
- *Local Food Movement:* Local producers can capitalize on the "locavore" movement by selling their goods through farmers' markets, CSAs, and co-ops. The movement encourages consumers to purchase and consume food from local, small-scale producers to help build social stability in communities (Miller and Lu, 2019). This could be effective in New England states, based on their proximity to urban centers and affluent consumers.
  - Local producers should collaborate with local chefs and restaurants to promote products to consumers, given that the Food Service and Ingredients markets can be difficult wholesale channels to enter (Canterbury Development Corporation, 2017).
  - Producers should partner with local distributors or category managers when working to expand to different markets. Local partnerships help ensure the success of products in new markets (Laudicina, McCaffrey, and Peterson 2018)

- *Consumer Education:* The industry should invest in consumer education to help distinguish sheep and goat milk from other dairy products. Additional consumer education is needed to justify the price differentials between cow dairy and goat/sheep dairy. Education highlighting the nutritional characteristics of goat and sheep milk products could be an effective strategy (Martin-Collado et al. 2019; Paskaš et al. 2020). Research indicates price can deter consumers from purchasing goat milk products yet consumers are often willing to pay more for food products with proven health benefits (Ali and Ali 2020; Wunsch 2020a).
- *Product marketing:* Marketing should promote the compositional differences that resonate with relevant consumers and market segments.
    - In Western countries, education and marketing should focus on the higher protein content in sheep and goat milk compared to cow milk. Protein is surging in popularity amongst Western consumers; the global protein ingredient market was valued at $38.5 billion in 2020 (Ismail et al. 2020; Grand View Research 2021).
    - In Asian countries, the focus should be on ease of digestion and feasibility for lactose-intolerant consumers because of the high rates of lactose intolerance in the region (Grand View Research 2020b). Highlighting the differences in nutritional makeup between goat and sheep milk and plant-based milk alternatives or traditional dairy products is likely to be valuable in all foreign markets as global demand for healthier food products grows (Nunes et al. 2020).
- *Smaller Formats:* Producers should consider using smaller formats for their products to satisfy consumers of all demographics and limit the risk for people trying new products. For example, millennials living on their own are unlikely to consume a liter of milk before it expires. Additionally, consumers of all demographics are unlikely to purchase a large volume of a product they have never tried before (Byron 2019; Devenyns 2019). This is supported by our consumer survey, where respondents indicated desiring quart-sized products for sheep and goat milk.
- *Environmentally Friendly Products:* Producers should take advantage of goat and sheep milk's environmentally clean image by avoiding practices like intensive milking that damage consumers' positive image of their products. Environmentally sustainable practices, including free-range grazing, may increase the concentration of beneficial phenolic compounds and the antioxidant capacity of goat milk, further increasing its value to consumers (Dos Santos et al. 2017; Machado et al. 2017; Ranadheera et al. 2012; 2013; Silveira et al. 2015). Consumers are willing to spend more on products they perceive as “natural” or environmentally sustainable (Migliore et al. 2018; Nguyen 2021).
- *Distribution Channels:* Producers should consider using online retail channels for their products, which experienced rapid growth during the COVID-19 pandemic. Online grocery sales grew 54% in 2020. eMarketer, a market research company, expects more than half (51.3%) of the U.S. population to buy groceries online by 2023, with per buyer spending exceeding $1000 a year (eMarketer 2021).
- *Changing Markets:* Producers should monitor emerging markets and trends impacting goat and sheep dairy’s in-market viability. Rising incomes, population growth and free trade agreements can enhance the attractiveness of different international markets (Canterbury Development Corporation, 2017).

6. Data Dashboard

Atlantic created an interactive data dashboard that dairy industry stakeholders can use to explore the data from the consumer preference survey. The dashboard is a web-based application hosted by Atlantic. It is available using following link: https://www.atlanticcorporation.com/vt-goat-sheep-dashboard.

The dashboard is easy to navigate and provides clear instructions as well as background information about the survey data. Users can query granular information such as “How much more are females in Massachusetts ages 35-44 years willing to pay for locally produced goat milk?” using dropdown filters (Figure 14).

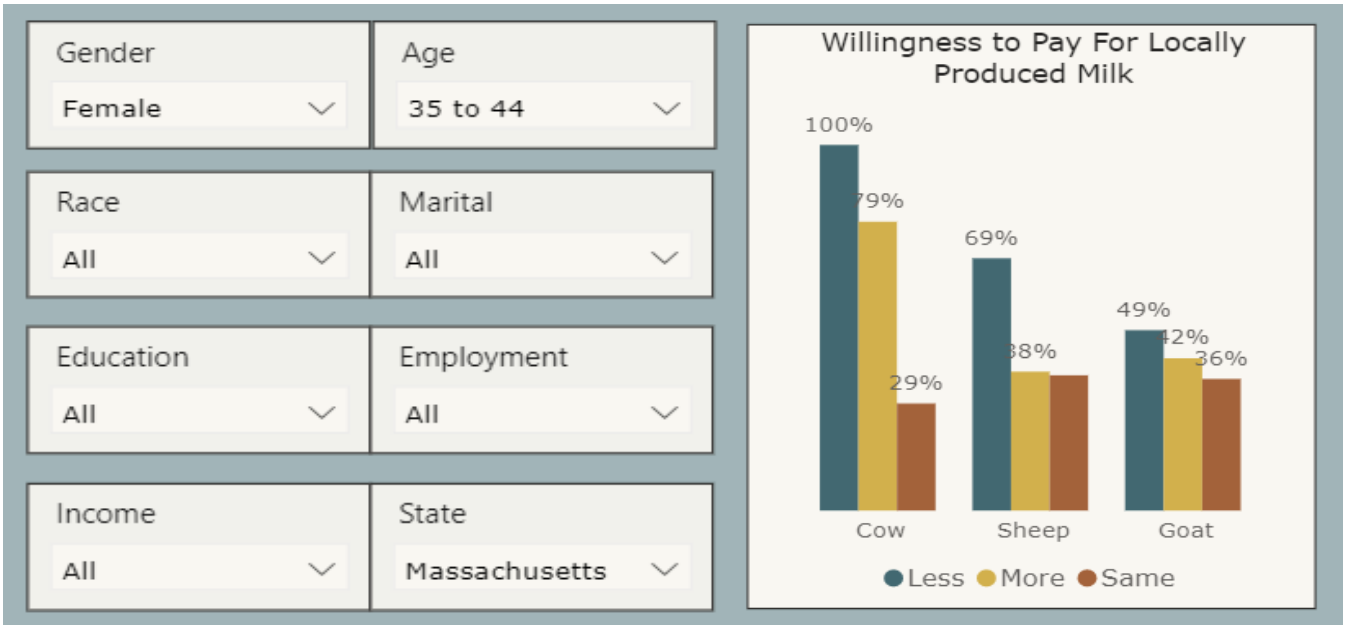

Figure 14. Example figure from the Goat and Sheep Dairy Product Data Dashboard showing those willing to pay more for locally produced milk based on the filters on the sidebar (females, ages 35-44, residing in Massachusetts)

The landing page allows users to select the dairy product of interest: cheese, milk, or yogurt. A user guide is provided instructing users how to select filters, reset filters, and to click on graphics to explore more granular detail. Users can click on a section of a graph to select a subgroup of respondents, and the data will then be filtered to that subgroup, changing all remaining graphs on the page automatically. For example, if users select those who prefer cow cheese by clicking on the cow portion of the pie chart (Figure 15), graphs showing packaging preferences will automatically filter to show only the packaging preferences for those who prefer cow cheese (Figure 16).

Atlantic will be hosting a webinar and stakeholder meeting with the NE-DBIC on July 15, 2021 to present findings of the research. We will present a demo of the dashboard and how to use it and will hold a Q&A session.

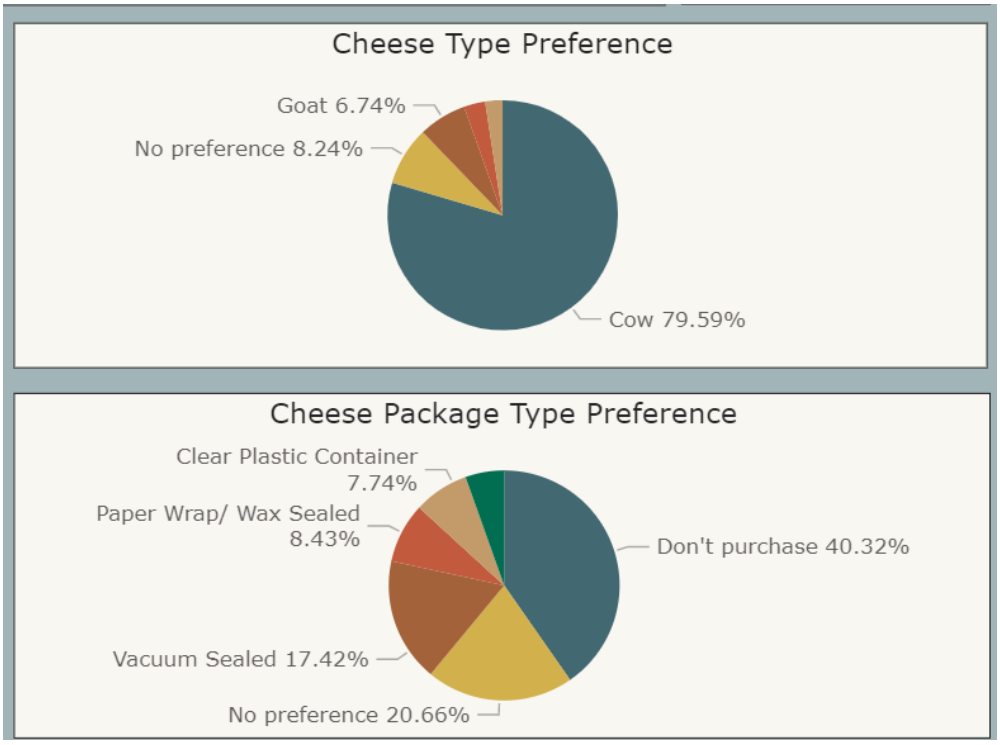

Figure 15. Cheese packaging preferences regardless of cheese type preference

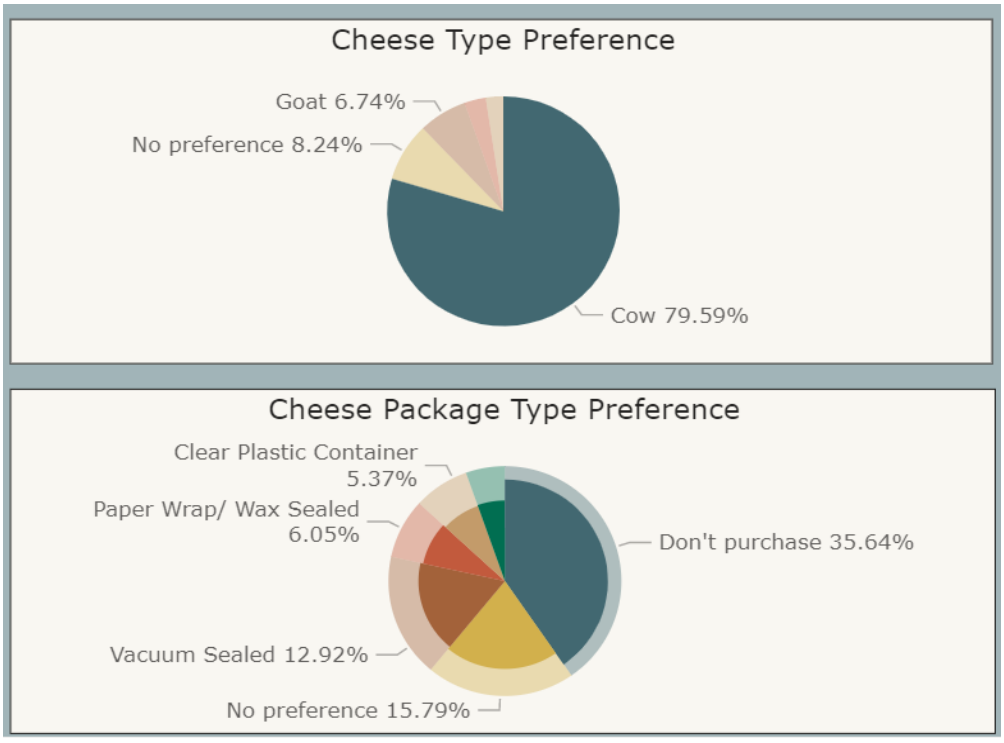

Figure 16. Cheese packing preferences for respondents who prefer cow cheese (the cow "slice" of the Cheese Type Preference" pie chart is selected)

Conclusion

This report provides detailed information from consumer, market, and stakeholder research that can position Vermont and other New England sheep and goat dairy producers to better compete in domestic and U.S. and international markets.

Through consumer research, we determined that sheep and goat cheese is the product most likely to succeed in the U.S. market of the three products studied. Secondary market research supports this claim, as do the sales of the respondents from our B2B survey as most were cheese producers. Additional market research uncovered other value-added sheep and goat dairy products popular in the global market, such as milk powder for use in infant formula, which is in high demand in Asian markets. Nutraceuticals, or supplements derived from food, are also expected to do well in global markets. These products made with sheep or goat milk can be marketed as high in vitamins, proteins, and electrolytes.

Educating consumers on the benefits of the sheep and goat dairy should increase consumption and demand for the products, especially as health awareness is rising. Goat and sheep dairy products have many benefits. Goat milk has a greater composition of important amino acids, and other vitamins and minerals and has beneficial probiotic and anti-infection characteristics, while sheep milk is high in fatty acids, proteins, vitamins, and minerals. Goat milk is also proven to be easier to digest than cow milk and can be marketed to compete with lactose-free or minimal-lactose products.

Consumer education should also improve awareness of the products. Our consumer research showed that many respondents did not perceive goat or sheep dairy products to be available for them for purchase in their usual retail channels. Providing opportunities for consumers to sample products should also drive consumption. Consumers who sampled sheep and goat dairy products purchased them from one-third to 60% of the time on average. Stores like Whole Foods, which offers samples and has a customer base that is willing to pay premiums for healthy products, could be profitable sales channels for goat and sheep dairy products.

In addition to highlighting the health benefits of sheep and goat dairy, in our B2B survey, we found that the most successful marketing strategies were the use of social media, bright and colorful packaging, and humorous advertisements. Emphasizing unique characteristics of the farms may be helpful as well, especially for consumers that prioritize local food and environmental sustainability.

Regardless of these marketing strategy opportunities, sheep and goat dairy stakeholders insist they need assistance from dairy associations and governmental agencies to help improve marketing strategies and increase consumer awareness. The industry is less mature than cow dairy, and there are fewer governmental resources available to producers, which makes operating costs higher and leaves less funds for producers to craft creative and successful marketing strategies, purchase advertisements, or invest in appealing packaging.

Local markets are commonly thought of as being the most profitable for sheep and goat dairy products, as consumers are often willing to pay premiums for local products. This finding was uncovered through our secondary market research and through the B2B interviews, yet consumer research showed that consumers may not place much importance on the geographic origin of their dairy products, or they prefer regional products. However, while fewer consumers are willing to pay more for local dairy, those willing to pay premiums are willing to pay roughly 20% more for cheese or yogurt and 30% more for milk over non-local sheep and goat dairy. The customer segment for local products may be smaller, but it could lead to greater profit margins. The most appropriate retail channels to capitalize on local food premiums are farmer's markets and farm stands, specialty food

stores, and local food stores or cooperatives. Producers could also work with local chefs and restaurants to break into wholesale markets.

Consumers ages 18-44 years as well as those who have children under 18 years in their households spend the most on dairy and are more likely to consume sheep and goat dairy, more willing to pay for local products, and are more familiar with the farm operations that produce their dairy products. More research is needed to determine whether age or having children is the dominant characteristic that drives these trends, as there is likely overlap between the two groups, but it is possible that both characteristics are equally important. It may also be prudent to study whether there are differences in dairy consumption as well as willingness to pay for local products across the subgroups within urban vs. suburban vs. rural areas to best narrow the target populations for niche products such as sheep and goat dairy. Multivariable regression analysis may uncover these results using the data that has already been collected.

Our research will provide sheep and goat dairy producers with comprehensive and precise data that can enable them improve marketing strategies, tailor production to products highest in demand, and identify target markets for their products. Our market research tools may also spur additional research in an industry where producers desperately need more resources and assistance in promoting their products and educating consumers.

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Appendix A. Survey Tool

Atlantic Goat and Sheep Dairy Market

Consumer Attitudes and Preferences Questionnaire (Web – Online Panel)

(Fourth Draft – October 19, 2020)

QUOTA GROUPS:	Total:	n=600		
	Maine:	n=75	Rhode Island:	n=75
	New Hampshire:	n=75	Connecticut:	n=75
	Vermont:	n=75	New York:	n=75
	Massachusetts:	n=75	New Jersey:	n=75

INTRODUCTION

Thank you for taking a few minutes out of your busy schedule to complete this questionnaire. It is about your perceptions of various dairy products, regardless of whether you regularly purchase dairyproducts or not. Your responses will remain strictly confidential. This survey is for research purposesonly – we will not try to sell you anything.

SCREENER

A. Which of the following categories describes your age? *(Please select one response)*

❒ Under 18	01	(THANK AND TERMINATE)
❒ 18 to 24	02	(CONTINUE)
❒ 25 to 34	03	
❒ 35 to 44	04	
❒ 45 to 54	05	
❒ 55 to 64	06	
❒ 65 to 74	07	
❒ 75 to 84	08	
❒ 85 or older	09	
❒ Prefer not to answer	98	(THANK AND TERMINATE)

IF MAINE, NEW HAMPSHIRE, VERMONT, MASSACHUSETTS, RHODE ISLAND, CONNECTICUT, NEWYORK AND NEW JERSEY (CHECK QUOTAS) CONTINUE, ELSE THANK AND TERMINATE

B. In which state is your primary residence located? *(Please select one response)*

C. Would you say you are the primary food (grocery) shopper in your household or do you equally share in the food shopping for your household? *(Please select one response)*

❒ Primary	1	(CONTINUE)
❒ Share	2	(CONTINUE)
❒ No	3	(THANK AND TERMINATE)

D. Which of the following dairy products (Cow, Goat or Sheep) would you say your householdconsumes at least once a month? *(Please select all that apply)* (RANDOMIZE LIST)

❒ Cheese	1
❒ Milk	2
❒ Yogurt	3
❒ Butter	4
❒ Cream	5
❒ Ice cream	6
❒ None at least once a month	9

IF "CHEESE," "MILK," AND/OR "YOGURT" CONTINUE ELSE, THANK AND

MAIN QUESTIONNAIRE

1. What is your **average monthly** expenditure on all food from: *(Please move slider to your response for each below – best estimate is fine)*
   a. **Food stores** (e.g., national retailers and membership clubs, regional grocery stores/ supermarkets, cooperative grocery stores/local organic markets, convenience stores, farmer's markets, farm stands, and specialty food markets, etc.): (SLIDER ←➔: $0 - $2,000+)
   b. **Mail order, subscription** and other home delivery services: (SLIDER ←➔: $0 - $2,000+)
   c. **Restaurants** and **prepared takeout**: (SLIDER ←➔: $0 - $2,000+)

ASK CHEESE, MILK AND YOGURT SECTIONS ONLY IF MENTIONED IN QDRANDOMIZE CHEESE, MILK

Cheese (ASK THIS SECTION OF QUESTIONS IF "**CHEESE**" MENTIONED IN QD)

2. Approximately, how much do you spend on **cheese** (cow, goat, sheep, non-dairy, etc.) for yourself and your household on average per month from the following retailers? *(Please move slider to your response for each below – best estimate is fine)* (RANDOMIZE LIST)

a. National retailers and membership clubs	SLIDER ←➔: $0 - $250+
b. Regional grocery stores/supermarkets	SLIDER ←➔: $0 - $250+
c. Cooperative grocery stores/local organic markets	SLIDER ←➔: $0 - $250+
d. Convenience stores	SLIDER ←➔: $0 - $250+
e. Farmer's markets/farm stands	SLIDER ←➔: $0 - $250+
f. Specialty food markets	SLIDER ←➔: $0 - $250+
g. Mail order and other home delivery	SLIDER ←➔: $0 - $250+

3. Of your monthly **cheese** expenditure, approximately what percentage do you spend on the following types of cheese? *(Please enter your responses for each below – best estimate is fine)*

a. Cow: _____%

b. Sheep: _____%

c. Goat: _____%

d. Others: _____%

Total: 100% (RUNNING TOTAL TO EQUAL 100%)

4. (IF Q3B = 0%) Have you ever tried sheep cheese? *(Please select one* response*)*

- ❑ Yes 1
- ❑ No 2
- ❑ Don't know 9

5. (IF Q3C = 0%) Have you ever tried goat cheese? *(Please select one* response*)*

- ❑ Yes 1
- ❑ No 2
- ❑ Don't know 9

6. (SHOW EACH REPORTED 1%+ IN Q3 OR "YES" IN Q4 OR Q5) Please rate the extent to which you dislike or like these types of **cheese**. If you have not consumed the type of **cheese** in the **past fiveyears**, select, "NA." *(Please select one response for each type of cheese)* (RANDOMIZE LIST)

Types of Cheese	Dislike Very Much							Like Very Much			NA
Cow	1	2	3	4	5	6	7	8	9	10	90
Sheep	1	2	3	4	5	6	7	8	9	10	90
Goat	1	2	3	4	5	6	7	8	9	10	90

7. (SHOW EACH REPORTED 0% IN Q3) Are the following types of **cheese** available for you to purchase?
(Please select one response for each type of cheese) (RANDOMIZE LIST)

Types of Cheese	Yes	No	Not Sure
Sheep	1	2	8
Goat	1	2	8

8. How much are you willing to pay for the following types of **cheese** compared to cow cheese? If more or less, please indicate the percentage. *(Please select a response)* (RANDOMIZE LIST)

Types of Cheese	More	Same	Less	Percent
Sheep	1	2	3	SLIDER ←→: 0% - 100%
Goat	1	2	3	SLIDER ←→: 0% - 100%

9. How much are you willing to pay for the following types of **cheese** if they are produced locally or northeast regionally compared to those produced in other areas of the U.S. or internationally? If more or less, please indicate the percentage. *(Please select one response for each – if none/nothing, please select 0%)* (RANDOMIZE LIST)

Types of Cheese	More	Same	Less	Percent
Cow	1	2	3	SLIDER ←→: 0% - 100%
Sheep	1	2	3	SLIDER ←→: 0% - 100%
Goat	1	2	3	SLIDER ←→: 0% - 100%

10. How much are you willing to pay for the following types of **cheese** if they are organically produced? If more or less, please indicate the percentage. *(Please select one response for each – if none/nothing, please select 0%)* (RANDOMIZE LIST)

Types of Cheese	More	Same	Less	Percent
Cow	1	2	3	SLIDER ←→: 0% - 100%
Sheep	1	2	3	SLIDER ←→: 0% - 100%
Goat	1	2	3	SLIDER ←→: 0% - 100%

11. When purchasing **cheese** products, what **size** package do you prefer? *(Please select one response for each)* (RANDOMIZE LIST)

	32 oz.	16 oz.	12 oz.	8 oz.	4 oz.	No Preference	Don't Purchase
Cow	1	2	3	4	5	6	7
Sheep	1	2	3	4	5	6	7
Goat	1	2	3	4	5	6	7

12. When purchasing specialty **cheese** products, what **type** of packaging do you prefer? *(Please select one response for each)* (RANDOMIZE LIST)

	Clear Plastic Container	White Plastic Container	Paper Wrap/ Wax Sealed	Vacuum Sealed	No Preference	Don't Purchase
Cow	1	2	3	4	6	7
Sheep	1	2	3	4	6	7
Goat	1	2	3	4	6	7

13. Assuming everything else, such as quality and price, is equal, which of the following types of **cheese** or cheese alternative do you prefer? *(Please select one response)* (RANDOMIZE 1-4)

- ❑ Cow 1
- ❑ Goat 2
- ❑ Sheep 3
- ❑ Plant-based 4
- ❑ No preference 8

14. How much detail would you like to know about where, geographically, the **cheese** products you purchase are produced? *(Please select one response)* (DO NOT RANDOMIZE)

- ❑ No detail 1
- ❑ Country 2
- ❑ State/Province 3
- ❑ County 4
- ❑ City/Town 5
- ❑ Specific farm 6
- ❑ Doesn't matter 7

15. In general, how unfamiliar or familiar are you with the dairy farms and businesses that produce the **cheese** products you purchase? *(Please select one response)*

Very Unfamiliar								**Very Familiar**	
1	2	3	4	5	6	7	8	9	10

16. Have you ever been in a retail setting where shoppers are sampling **cheese**? *(Please select one response)*

- ❑ Yes 1
- ❑ No 2

17. Have you ever sampled **cheese** in a retail setting? *(Please select one response)*

- ❑ Yes 1 (CONTINUE)
- ❑ No 2 (SKIP TO Q19)

18. What percent of the time do you purchase **cheese** that you sampled? *(Please select your response below)*

SLIDER ←➔: 0% - 100%

19. What percent of the time do you look for a **label** to provide product information before purchasing the following types of **cheese**? *(Please select your response below)*

Types of Cheese	**Percent**
Cow	SLIDER ←➔: 0% - 100%
Sheep	SLIDER ←➔: 0% - 100%
Goat	SLIDER ←➔: 0% - 100%

20. What percent of the time do you look for a **store sign** to provide product information before purchasing the following types of **cheese**? *(Please select your response below)*

Types of Cheese	**Percent**
Cow	SLIDER ←➔: 0% - 100%
Sheep	SLIDER ←➔: 0% - 100%
Goat	SLIDER ←➔: 0% - 100%

Milk (ASK THIS SECTION OF QUESTIONS IF "**MILK**" MENTIONED IN QD)

21. Approximately, how much do you spend on **milk** (cow, goat, sheep, non-dairy, etc.) for yourself and your household on average per month from the following retailers? *(Please move slider to your response for each below – best estimate is fine)* (RANDOMIZE LIST)

a. National retailers and membership clubs	SLIDER ←➔: $0 - $250+
b. Regional grocery stores/supermarkets	SLIDER ←➔: $0 - $250+
c. Cooperative grocery stores/local organic markets	SLIDER ←➔: $0 - $250+
d. Convenience stores	SLIDER ←➔: $0 - $250+
e. Farmer's markets/farm stands	SLIDER ←➔: $0 - $250+
f. Specialty food markets	SLIDER ←➔: $0 - $250+
g. Mail order and other home delivery	SLIDER ←➔: $0 - $250+

22. Approximately what percentage of the average monthly amount you spend on **milk** for yourself and your household is spent on the following types of milk? *(Please enter your responses for each below – best estimate is fine)*

a. Cow: _____%

b. Sheep: _____%

c. Goat: _____%

d. Others: _____%

Total: 100% (RUNNING TOTAL TO EQUAL 100%)

23. (IF Q22B = 0%) Have you ever tried sheep milk? *(Please select one* response*)*

- ❑ Yes 1
- ❑ No 2
- ❑ Don't know 9

24. (IF Q22C = 0%) Have you ever tried goat milk? *(Please select one* response*)*

- ❑ Yes 1
- ❑ No 2
- ❑ Don't know 9

25. (SHOW EACH REPORTED 1%+ IN Q22 OR "YES" IN Q23 OR Q24) Please rate the extent to which youdislike or like these types of **milk**. If you have not consumed the type of **milk** in the **past five years**, select, "NA." *(Please select one response for each type of milk)* (RANDOMIZE LIST)

	Dislike									Like	
Types of Milk	**Very Much**									**Very Much**	**NA**
Cow	1	2	3	4	5	6	7	8	9	10	90
Sheep	1	2	3	4	5	6	7	8	9	10	90
Goat	1	2	3	4	5	6	7	8	9	10	90

26. (SHOW EACH REPORTED 0% IN Q22) Are the following types of **milk** available for you to purchase?
(Please select one response for each type of milk) (RANDOMIZE LIST)

Types of Milk	**Yes**	**No**	**Not Sure**
Sheep	1	2	8
Goat	1	2	8

27. How much are you willing to pay for the following types of **milk** compared to cow milk? *(Pleaseselect a response)* (RANDOMIZE LIST)

Types of Milk	**More**	**Same**	**Less**	**Percent**
Sheep	1	2	3	SLIDER ←→: 0% - 100%
Goat	1	2	3	SLIDER ←→: 0% - 100%

28. How much are you willing to pay for the following types of **milk** if they are produced locally or northeast regionally compared to those produced in other areas of the U.S.? If more or less, please indicate the percentage. *(Please select one response for each – if none/nothing, please select 0%)* (RANDOMIZE LIST)

Types of Milk	**More**	**Same**	**Less**	**Percent**
Cow	1	2	3	SLIDER ←→: 0% - 100%
Sheep	1	2	3	SLIDER ←→: 0% - 100%
Goat	1	2	3	SLIDER ←→: 0% - 100%

29. How much are you willing to pay for the following types of **milk** if they are organically produced? Ifmore or less, please indicate the percentage. *(Please select one response for each – if none/nothing, please select 0%)* (RANDOMIZE LIST)

Types of Milk	**More**	**Same**	**Less**	**Percent**
Cow	1	2	3	SLIDER ←→: 0% - 100%
Sheep	1	2	3	SLIDER ←→: 0% - 100%
Goat	1	2	3	SLIDER ←→: 0% - 100%

30. When purchasing **milk** products, what **size** package do you prefer? *(Please select one response for each)* (RANDOMIZE LIST)

	Gallon	Half Gallon	Quart	16 oz./ Pint	No Preference	Don't Purchase
Cow	1	2	3	4	8	6
Sheep	1	2	3	4	8	6
Goat	1	2	3	4	8	6

31. When purchasing **milk** products, what **type** of packaging do you prefer? *(Please select one response for each)* (RANDOMIZE LIST)

	Clear Plastic Container	White Plastic Container	Carton	Glass	No Preference	Don't Purchase
Cow	1	2	3	4	8	6
Sheep	1	2	3	4	8	6
Goat	1	2	3	4	8	6

32. When purchasing **small batch or artisan milk** products, what **size** package do you prefer? *(Pleaseselect one response for each)* (RANDOMIZE LIST)

	Gallon	Half Gallon	Quart	16 oz./ Pint	No Preference	Don't Purchase
Cow	1	2	3	4	8	6
Sheep	1	2	3	4	8	6
Goat	1	2	3	4	8	6

33. When purchasing **small batch or artisan milk** products, what **type** of packaging do you prefer? *(Please select one response for each)* (RANDOMIZE LIST)

	Clear Plastic Container	White Plastic Container	Carton	Glass	No Preference	Don't Purchase
Cow	1	2	3	4	8	6
Sheep	1	2	3	4	8	6
Goat	1	2	3	4	8	6

34. Assuming everything else, such as quality and price, is equal, which of the following types of **milk** ormilk substitute do you prefer? *(Please select one response)* (RANDOMIZE 1-4)

- ❑ Cow 1
- ❑ Goat 2
- ❑ Sheep 3
- ❑ Plant-based (Almond, Soy, etc.) 4
- ❑ No preference 8

35. How much detail would you like to know about where, geographically, the **milk** products you purchase are produced? *(Please select one response)* (DO NOT RANDOMIZE)

- ❑ No detail 1
- ❑ Country 2
- ❑ State/Province 3
- ❑ County 4
- ❑ City/Town 5
- ❑ Specific farm 6
- ❑ Doesn't matter 7

36. In general, how unfamiliar or familiar are you with the dairy farms and businesses that produce the **milk** products you purchase? *(Please select one response)*

Very Unfamiliar								Very Familiar	
1	2	3	4	5	6	7	8	9	10

IF Q22B OR Q22C IS GREATER THAN 0 OR Q23 = 1 OR Q24 = 1 CONTINUE, ELSE

37. Have you ever been in a retail setting where shoppers are sampling **goat or sheep milk**? *(Please select one response)*

- ❑ Yes 1
- ❑ No 2

38. Have you ever sampled **goat or sheep milk** in a retail setting? *(Please select one response)*

- ❑ Yes 1 (CONTINUE)
- ❑ No 2 (SKIP TO Q40)

39. What percent of the time do you purchase **goat or sheep milk** that you sampled? *(Please select your response below)*

SLIDER ←➔: 0% - 100%

40. What percent of the time do you look for a **label** to provide product information before purchasing the following types of **milk**? *(Please select your response below)*

Types of Milk	**Percent**
Cow	SLIDER ←➔: 0% - 100%
Sheep	SLIDER ←➔: 0% - 100%
Goat	SLIDER ←➔: 0% - 100%

41. What percent of the time do you look for a **store sign** to provide product information before purchasing the following types of **milk**? *(Please select your response below)*

Types of Milk	**Percent**
Cow	SLIDER ←➔: 0% - 100%
Sheep	SLIDER ←➔: 0% - 100%
Goat	SLIDER ←➔: 0% - 100%

Yogurt (ASK THIS SECTION OF QUESTIONS IF "**YOGURT**" MENTIONED IN QD)

42. Approximately, how much do you spend on **yogurt** (cow, goat, sheep, plant-based, etc.) for yourself and your household on average per month from the following retailers? *(Please move slider to your response for each below – best estimate is fine)* (RANDOMIZE LIST)

a. National retailers and membership clubs	SLIDER ←➔: $0 - $250+
b. Regional grocery stores/supermarkets	SLIDER ←➔: $0 - $250+
c. Cooperative grocery stores/local organic markets	SLIDER ←➔: $0 - $250+
d. Convenience stores	SLIDER ←➔: $0 - $250+
e. Farmer's markets/farm stands	SLIDER ←➔: $0 - $250+
f. Specialty food markets	SLIDER ←➔: $0 - $250+
g. Mail order and other home delivery	SLIDER ←➔: $0 - $250+

43. Approximately what percentage of the average monthly amount you spend on **yogurt** for yourself and your household is spent on the following types of yogurt? *(Please enter your responses for each below – best estimate is fine)*

a. Cow: _____%

b. Sheep: _____%

c. Goat: _____%

d. Others: _____%

Total: 100% (RUNNING TOTAL TO EQUAL 100%)

44. (IF Q43B = 0%) Have you ever tried sheep yogurt? *(Please select one* response*)*

- ❑ Yes 1
- ❑ No 2
- ❑ Don't know 9

45. (IF Q43C = 0%) Have you ever tried goat yogurt? *(Please select one* response*)*

- ❑ Yes 1
- ❑ No 2
- ❑ Don't know 9

46. (SHOW EACH REPORTED 1%+ IN Q43 OR "YES" IN Q44 OR Q45) Please rate the extent to which youdislike or like these types of **yogurt**. If you have not consumed the type of **yogurt** in the **past five years**, select, "NA." *(Please select one response for each type of yogurt)* (RANDOMIZE LIST)

Types of Yogurt	Dislike Very Much									Like Very Much	NA
Cow	1	2	3	4	5	6	7	8	9	10	90
Sheep	1	2	3	4	5	6	7	8	9	10	90
Goat	1	2	3	4	5	6	7	8	9	10	90

47. (SHOW EACH REPORTED 0% IN Q43) Are the following types of **yogurt** available for you topurchase? *(Please select one response for each type of yogurt)* (RANDOMIZE LIST)

Types of Yogurt	Yes	No	Not Sure
Sheep	1	2	8
Goat	1	2	8

48. How much are you willing to pay for the following types of **yogurt** compared to cow yogurt? *(Please select a response)* (RANDOMIZE LIST)

Types of Yogurt	More	Same	Less	Percent
Sheep	1	2	3	SLIDER ←➔: 0% - 100%
Goat	1	2	3	SLIDER ←➔: 0% - 100%

49. How much are you willing to pay for the following types of **yogurt** if they are produced locally or northeast regionally compared to those produced in other areas of the U.S.? If more or less, please indicate the percentage. *(Please select one response for each – if none/nothing, please select 0%)* (RANDOMIZE LIST)

Types of Yogurt	More	Same	Less	Percent
Cow	1	2	3	SLIDER ←➔: 0% - 100%
Sheep	1	2	3	SLIDER ←➔: 0% - 100%
Goat	1	2	3	SLIDER ←➔: 0% - 100%

50. How much more are you willing to pay for the following types of **yogurt** if they are organically produced? If more or less, please indicate the percentage. *(Please select one response for each – if none/nothing, please select 0%)* (RANDOMIZE LIST)

Types of Yogurt	More	Same	Less	Percent
Cow	1	2	3	SLIDER ←➔: 0% - 100%
Sheep	1	2	3	SLIDER ←➔: 0% - 100%
Goat	1	2	3	SLIDER ←➔: 0% - 100%

51. When purchasing **yogurt** products, what **size** package do you prefer? *(Please select one response for each)* (RANDOMIZE LIST)

	Quart	16 oz./ Pint	5oz. to 6oz. Cup	No Preference	Don't Purchase
Cow	1	2	3	8	6
Sheep	1	2	3	8	6
Goat	1	2	3	8	6

52. When purchasing specialty **yogurt** products, what **type** of package do you prefer? *(Please select one response for each)* (RANDOMIZE LIST)

	Clear Glass Container	White Plastic Container	Drinkable Container	Squeeze Tube	No Preference	Don't Purchase
Cow	1	2	3	4	8	6
Sheep	1	2	3	4	8	6
Goat	1	2	3	4	8	6

53. Assuming everything else, such as quality and price, is equal, which of the following types of **yogurt** do you prefer? *(Please select one response)* (RANDOMIZE 1-4)

- ❑ Cow 1
- ❑ Goat 2
- ❑ Sheep 3
- ❑ Plant-based (Almond, Soy, etc.) 4
- ❑ No preference 8

54. How much detail would you like to know about where, geographically, the **yogurt** products you purchase are produced? *(Please select one response)* (DO NOT RANDOMIZE)

- ❑ No detail 1
- ❑ Country 2
- ❑ State/Province 3
- ❑ County 4
- ❑ City/Town 5
- ❑ Specific farm 6
- ❑ Doesn't matter 7

55. In general, how unfamiliar or familiar are you with the dairy farms and businesses that produce the **yogurt** products you purchase? *(Please select one response)*

Very Unfamiliar								Very Familiar	
1	2	3	4	5	6	7	8	9	10

IF Q43B OR Q43C IS GREATER THAN 0 OR Q44 = 1 OR Q45 = 1 CONTINUE, ELSE

56. Have you ever been in a retail setting where shoppers are sampling **goat or sheep yogurt**? *(Please select one response)*

- ❑ Yes 1
- ❑ No 2

57. Have you ever sampled **goat or sheep yogurt** in a retail setting? *(Please select one response)*

- ❑ Yes 1 (CONTINUE)
- ❑ No 2 (SKIP TO Q59)

58. What percent of the time do you purchase **goat or sheep yogurt** that you sampled? *(Please select your response below)*

SLIDER ←➔: 0% - 100%

59. What percent of the time do you look for a **label** to provide product information before purchasing the following types of **yogurt**? *(Please select your response below)*

Types of Yogurt	Percent
Cow	SLIDER ←➔: 0% - 100%
Sheep	SLIDER ←➔: 0% - 100%
Goat	SLIDER ←➔: 0% - 100%

60. What percent of the time do you look for a **store sign** to provide product information before purchasing the following types of **yogurt**? *(Please select your response below)*

Types of Yogurt	Percent
Cow	SLIDER ←➔: 0% - 100%
Sheep	SLIDER ←➔: 0% - 100%
Goat	SLIDER ←➔: 0% - 100%

CLASSIFICATION

61. The remaining questions are for classification purposes only and will not be used to identify you in any way. What is the 5-digit zip code where your primary residence is located? *(Please enter your response below)*

_____/_____/_____/_____/_____

62. How would you characterize the setting of your primary residence? *(Please select one response)*

- ❑ Urban 1
- ❑ Suburban 2
- ❑ Rural 3
- ❑ Prefer not to answer 8

63. What is your marital status? *(Please select one response)*

- ❑ Single, never married 1
- ❑ Married or Partnered 2
- ❑ Previously married 3
- ❑ Prefer not to answer 8

64. How many adults (18 years or older), including yourself, live in your household? *(Please select oneresponse)*

- ❑ 1 1
- ❑ 2 2
- ❑ 3 3
- ❑ 4 4
- ❑ 5 or more 5
- ❑ Prefer not to answer 8

65. How many children under the age of 18 live in your household? *(Please select one response)*

- ❑ None 1
- ❑ 1 2
- ❑ 2 3
- ❑ 3 4
- ❑ 4 or more 5
- ❑ Prefer not to answer 8

66. For how many household members (adults and children), including yourself, do you purchasegroceries and/or meals? *(Please select one response)*

- ❑ 1 1
- ❑ 2 2
- ❑ 3 3
- ❑ 4 4
- ❑ 5 5
- ❑ 6 6
- ❑ 7 or more 7
- ❑ Prefer not to answer 8

67. What is your employment status? *(Please select one response)*

- ❑ Employed full-time (30 hours or more) 1
- ❑ Employed part-time (less than 30 hours) 2
- ❑ Unemployed 3
- ❑ Retired 4
- ❑ Stay at home parent 5
- ❑ Military 6
- ❑ Student 7
- ❑ Prefer not to answer 8

68. What is the highest level of education you have completed? *(Please select one response)*

- ❒ Less than high school degree 1
- ❒ High school degree 2
- ❒ Some college 3
- ❒ Two year college/technical degree 4
- ❒ Four year college degree 5
- ❒ Some Graduate work 6
- ❒ Graduate degree (Masters, PhD, etc.) 7
- ❒ Prefer not to answer 8

69. Into which of the following general categories does your 2019 household income before taxes fall?
(Please select one response)

- ❑ Less than $15,000, 01
- ❑ $15,000 to less than $25,000, 02
- ❑ $25,000 to less than $35,000, 03
- ❑ $35,000 to less than $50,000, 04
- ❑ $50,000 to less than $75,000, 05
- ❑ $75,000 to less than $100,000, 06
- ❑ $100,000 to less than $150,000 07
- ❑ $150,000 to less than $200,000 08
- ❑ $200,000 or more 09
- ❑ Prefer not to answer 98
- ❑ Don't know 99

70. With what race and/or ethnicity do you associate? *(Please select one response)* (DROP DOWNMENU)

- ❑ American Indian or Alaska Native 01
- ❑ Asian 02
- ❑ Black or African American 03
- ❑ Hispanic or Latino 04
- ❑ Native Hawaiian or Other Pacific Islander 05
- ❑ White 06
- ❑ Two or more races/ethnicities 07
- ❑ Other *(Please specify)*: <<OTHER SPECIFY – ACCEPT UP TO 100 CHARACTERS>>
- ❑ Prefer not to answer 98

71. Please select the gender with which you most closely associate. *(Please select one response)*

- ❑ Female 1
- ❑ Male 2
- ❑ Gender neutral 3
- ❑ Prefer not to answer 8

Thank you very much for your time!

Appendix B. Consumer Preference Survey Methodology

Atlantic developed and implemented a consumer preference survey to assess domestic demographics and insights on sheep and goat milk products across the following eight Northeastern U.S. states: Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, New York and New Jersey. Our initial target was to collect 600 internet-based surveys distributed evenly, with at least 75 participants representing each state. A random sample of n=600 generates a maximum sampling error or confidence interval of +/- 4.0 percentage points at the 95% confidence level. That is, for a reported 50% where variability is at its greatest, one can be 95% sure the results for the entire population would fall between 46.0% and 54.0%. State-level data will be most useful for state-to-state comparisons.

The survey was developed by Atlantic in conjunction with VAAFM and administered in collaboration with the Portland Research Group. Panelists were engaged from a national representative online panel using a broad range of sources, including active recruitment. To ensure a representative sample, we screened the following criteria: 1) adults ages 18 and older living on their own; 2) reasonable distribution of age, gender, and household income; and 3) good representation of primary residence settings (urban, suburban, rural). Panel managers closely assessed the responses provided and the time it took panelists to complete surveys.

The survey consisted of an estimated 75 closed-ended questions, including screeners (Appendix A). The survey included demographic adjustments to specifically engage a representative sample of Millennial and older Gen Z participants (ages 18 to 38), which previous research show have a high level of interest in goat and sheep milk products.

Specific objectives of the insights survey included:

- Identifying households' consumption of dairy products in general;
- Determining dairy product purchase expenditures and types of retailers used for dairy product purchases;
- Understanding preferences for different types of cow, sheep and goat dairy products (cheese, milk, and yogurt)
- Gauging preferences for sheep and goat cheese, yogurt and milk packaging; and
- Exploring at a high level sheep and goat cheese, yogurt and milk shopping habits.

Data analysis was conducted by Atlantic and PRG using descriptive statistics such as means and medians for continuous data and frequencies and percentages for categorical variables. We used t-tests at the 95% level of confidence to determine significant differences in key variables of interest across demographic subgroups.

Appendix C. Consumer Survey Tables

Table C1. Respondent Characteristics	
Characteristic	**N (%)**
Age	
18-44	171 (28.6%)
45-64	206 (34.5%)
65 or older	220 (36.9%)
Female	327 (54.8%)
Marital Status	
Single	136 (22.8%)
Married	373 (62.5%)
Previously married	84 (14.1%)
Race	
White	526 (88.1%)
Non-white	67 (11.2%)
Income	
Less than $50k	185 (31.0%)
$50k – less than $100k	161 (27.0%)
More than $100k	194 (32.5%)
Prefer not to answer	53 (8.9%)
Education level	
Less than high school degree	2 (0.3%)
High school	98 (16.4%)
Some college	164 (27.5%)
Bachelor's degree	192 (32.2%)
Graduate degree	139 (23.3%)
Employment	
Employed full-time	204 (34.2%)
Employed part-time	54 (9.0%)
Unemployed	92 (15.4%)
Retired	226 (37.9%)
Student	8 (1.3%)
Number of household members*	
1	147 (24.6%)
2	279 (46.7%)
3+	165 (31.3%)
Presence of children in household	124 (20.8%)
Setting	
Urban	134 (22.4%)
Suburban	289 (48.4%)
Rural	173 (29.0%)

For Tables C2-C7, each category is labeled A-H. Cells with a letter next to the result indicate that the result is significantly higher than the column referenced at the 95% confidence level.

Table C2. Average monthly spending on cheese by retail location and state.

	ME n=68 A	NH n=70 B	VT n=68 C	MA n=63 D	RI n=68 E	CT n=70 F	NY n=62 G	NJ n=65 H
National Retailers and Membership Clubs	$11.60	$14.70	$9.50	$21.80	$12.40	$14.60	$30.80 ABCDEF	$29.90 ACE
Regional Grocery Stores/ Supermarkets	$30.10	$41.80	$28.70	$41.10	$29.90	$34.10	$54.20 ACEF	$46.20 C
Cooperative Grocery Stores/ Local Organic Markets	$9.70	$12.10	$6.80	$17.20 E	$5.20	$10.60	$28.70 ABCEF	$22.20 CE
Convenience Stores	$9.20	$6.10	$2.30	$23.60 BCE	$5.70	$10.40 C	$26.00 ABCEF	$23.20 BCE
Farmer's Markets/ Farm Stands	$10.20 C	$10.40	$1.60	$17.90 C	$5.50	$10.00 C	$25.20 ABCEF	$22.10 CE
Specialty Food Markets	$7.90	$8.50	$3.70	$18.00 CE	$5.80	$11.70	$29.90 ABCDEF	$27.70 ABCEF
Mail Order and Other Home Delivery	$5.80	$9.30	$2.50	$18.70 ACE	$5.50	$8.00	$25.00 ABCEF	$22.90 ACE

Table C3. Average monthly spending on milk by retail location and state.

	ME n=63 A	NH n=62 B	VT n=65 C	MA n=63 D	RI n=71 E	CT n=71 F	NY n=61 G	NJ n=66 H
National Retailers and Membership Clubs	$11.90	$11.40	$10.90	$30.60 ABCEF	$13.80	$14.30	$36.50 ABCEF	$49.00 ABCEF
Regional Grocery Stores/ Supermarkets	$36.70	$39.00	$28.70	$50.30 C	$32.40	$34.80	$52.10 CE	$55.10 CEF
Cooperative Grocery Stores/ Local Organic Markets	$11.90	$12.30	$5.60	$27.70 CF	$12.90	$12.00	$31.10 ABCEF	$37.20 ABCEF
Convenience Stores	$15.00	$12.50	$5.20	$32.50 ABCEF	$7.50	$10.80	$33.90 ABCEF	$41.30 ABCEF
Farmer's Markets/ Farm Stands	$10.50	$11.00	$3.80	$25.20 CE	$5.60	$10.20	$33.70 ABCEF	$37.70 ABCEF
Specialty Food Markets	$12.50	$10.80	$4.10	$25.90 CE	$7.20	$10.80	$33.50 ABCEF	$40.20 ABCEF
Mail Order and Other Home Delivery	$9.20	$11.40	$4.20	$23.90 CE	$7.00	$13.10	$33.80 ABCEF	$38.80 ABCEF

Table C4. Average monthly spending on yogurt by retail location and state.

	ME n=53 A	NH n=46 B	VT n=52 C	MA n=54 D	RI n=52 E	CT n=57 F	NY n=46 G	NJ n=39 H
National Retailers and Membership Clubs	$12.40	$7.60	$4.40	$17.90 C	$11.60	$18.00 C	$30.10 BC	$34.70 ABCE
Regional Grocery Stores/ Supermarkets	$39.80	$35.00	$28.90	$42.20	$33.60	$44.00	$62.10 BCE	$50.80 C
Cooperative Grocery Stores/ Local Organic Markets	$10.80	$6.10	$2.90	$13.90 C	$4.40	$16.70 C	$23.60 BCE	$33.60 ABCE
Convenience Stores	$9.30	$6.70	$5.60	$11.00	$3.70	$14.40	$19.50 E	$30.50 ABCE
Farmer's Markets/ Farm Stands	$6.90	$6.50	$2.80	$12.50	$2.80	$21.80 CE	$23.40 ACE	$34.40 ABCE
Specialty Food Markets	$7.00	$5.30	$2.50	$13.30 CE	$2.80	$13.90	$26.30 ABCE	$34.10 ABCE
Mail Order and Other Home Delivery	$9.40	$7.90	$2.70	$13.60 C	$5.80	$11.60	$22.30 CE	$30.20 CE

Table C5. Average monthly spending on cheese by age, income, and presence of children in household

	Age			Income			Presence of Kids	
	18 to 44	45 to 64	65+	<$50K	$50K-$100K	$100K+	Yes	No
	n=144	n=185	n=205	n=168	n=147	n=173	n=103	n=430
	A	B	C	D	E	F	G	H
National Retailers and Membership Clubs	$35.80 BC	$13.30	$9.50	$14.40	$13.70	$26.40 DE	$44.60 H	$11.50
Regional Grocery Stores/ Supermarkets	$54.00 BC	$32.50	$31.80	$41.30	$31.00	$42.80 E	$64.00 H	$31.90
Cooperative Grocery Stores/ Local Organic Markets	$34.60 BC	$7.80	$4.60	$13.80	$8.70	$19.70 E	$38.60 H	$7.90
Convenience Stores	$34.90 BC	$8.20 C	$1.80	$12.30	$8.30	$18.70 E	$42.70 H	$5.90
Farmer's Markets/ Farm Stands	$34.00 BC	$7.80 C	$1.90	$10.00	$8.70	$19.80 DE	$44.10 H	$5.10
Specialty Food Markets	$34.50 BC	$9.90 C	$2.90	$11.90	$8.30	$22.20 DE	$42.50 H	$7.00
Mail Order and Other Home Delivery	$32.90 BC	$6.50 C	$2.10	$10.10	$7.30	$18.90 E	$40.70 H	$5.10

Table C6. Average monthly spending on milk by age, income, and presence of children in household

	Age			Income			Presence of Kids	
	18 to 44	45 to 64	65+	<$50K	$50K-$100K	$100K+	Yes	No
	n=150	n=186	n=186	n=164	n=139	n=168	n=112	n=409
	A	B	C	D	E	F	G	H
National Retailers and Membership Clubs	$45.10 BC	$17.00 C	$8.70	$17.00	$16.00	$34.00 DE	$58.80 H	$12.10
Regional Grocery Stores/ Supermarkets	$64.30 BC	$35.70	$27.30	$42.00 E	$30.30	$51.60 E	$79.20 H	$30.50
Cooperative Grocery Stores/ Local Organic Markets	$47.30 BC	$10.90	$3.40	$16.30	$10.90	$30.30 E	$59.00 H	$7.70
Convenience Stores	$49.80 BC	$12.90 C	$1.80	$21.20 E	$11.20	$28.20 E	$62.00 H	$8.00
Farmer's Markets/ Farm Stands	$45.40 BC	$9.40 C	$1.50	$13.80	$9.20	$29.60 DE	$58.30 H	$5.70
Specialty Food Markets	$48.60 BC	$10.00 C	$0.90	$14.70	$11.10	$30.00 DE	$61.80 H	$5.90
Mail Order and Other Home Delivery	$47.20 BC	$10.00 C	$0.90	$13.60	$10.90	$29.70 E	$59.00 H	$6.10

Table C7. Average monthly spending on yogurt by age, income, and presence of children in household

	Age			Income			Presence of Kids	
	18 to 44	45 to 64	65+	<$50K	$50K-$100K	$100K+	Yes	No
	n=117	n=138	n=144	n=120	n=113	n=133	n=88	n=310
	A	B	C	D	E	F	G	H
National Retailers and Membership Clubs	$34.60 BC	$9.50	$8.40	$12.70	$11.40	$24.40 DE	$40.80 H	$9.60
Regional Grocery Stores/ Supermarkets	$60.10 BC	$33.40	$34.40	$39.20	$32.40	$52.70 E	$66.00 H	$34.80
Cooperative Grocery Stores/ Local Organic Markets	$35.50 BC	$6.80 C	$1.60	$16.00	$8.60	$16.90	$38.80 H	$6.20
Convenience Stores	$32.40 BC	$5.50	$1.60	$13.60	$7.50	$15.90	$37.50 H	$4.80
Farmer's Markets/ Farm Stands	$34.60 BC	$6.30	$2.60	$12.40	$8.80	$19.40	$38.40 H	$6.20
Specialty Food Markets	$32.10 BC	$5.50	$3.00	$11.00	$7.00	$19.50 E	$36.40 H	$5.60
Mail Order and Other Home Delivery	$33.70 BC	$5.20	$1.80	$10.70	$9.00	$17.60	$38.70 H	$4.80

Appendix D. B2B Methodology

Atlantic built a contact database of goat and sheep dairy producers located in New England, consisting of company name, location, contact name, phone number, and email. Methods for selection included the membership list from two associations: Vermont Sheep and Goat Association and the Vermont Cheese Guild. Additional candidates outside of Vermont were found through direct query of various online search engines.

The survey instrument (available in Appendix A) was developed by Atlantic. It consisted of 17 questions and was designed to be completed in less than 10 minutes through informal phone interviews. Four of the survey questions were related to general information (company name, experience, # of employees, etc.), six questions related to product type and price points, and seven questions related to distribution. Other questions asked for respondent opinion on the state of the industry and feedback for what might be done to improve it.

The project team contacted 107 goat and sheep dairies via phone/email to participate in the B2B survey. Potential participants were contacted a maximum of two times over four weeks starting March 1, 2021 and concluding March 31, 2021. Survey participants were contacted by phone and invited to participate. If they agreed, the survey was administered over the phone. If they were unavailable, a call-back time was scheduled for a phone survey or they were offered the option to complete the web-based survey, developed using SurveyPlanet. Data was aggregated in SurveyPlanet and analyzed using Microsoft Excel.

Appendix E. List of B2B Survey Respondents

Knotty Goat Soapery
Winterport, ME
(207) 223-5115

Abraham's Goat Farm & Creamery
Newport, ME
(207) 368-2165

Sunset Acres Farm and Dairy
Brooksville, ME
(207) 326-4741

Four Hearts Farm Udderly Delicious Creamery
Waterboro, ME
(207) 459-6607

Ten Apple Farm
Gray, ME
(207) 657-7880

Paradise Farm
Lyndeborough, NH
(603) 345-0860

Sunset Rock Farm
Lebanon, NH
(603) 448-3499

Purely Wholesome Farm
Loudon, NH
(603) 988-4109

Field O Dreams Farm
Amherst, NH
(603) 620-0166

Little White Goat Dairy
Orange, MA
(978) 790-1240

Barn First Creamery
Westfield, VT
(802) 744-6852

Blue Ledge Farm
Salisbury, VT
(802) 247-0095

Midnight Goat Farm
Huntington, VT
(802) 882-1952

Villa Villekulla Farm
Tunbridge, VT
(347) 276-7131

East Meets West Family Farm
Richford, VT
(802) 933-2998

Maggie's Farm at Mulberry Creek
Bowdoinham, ME
(812) 489-1349

Fat Sheep Farm
Windsor, VT
(802) 436-4696

Boston Post Dairy LLC
Enosburg Falls, VT
(802) 933-2749

Wooly Hill Farm
Bridport, VT
(802) 758-5083

Lazy Lady Farm
Westfield, VT
(802) 744-6325

Woodcock Farm Cheese Comp.
Weston, VT
(802) 824-6135

Tide Mill Creamery & Long Lost Farm
Dennysville, ME
(207) 271-6654

Sage Farm Goat Dairy
Stowe, VT
(802) 760-0943

Ice House Farm
Goshen, VT
(802) 247-1443

AlpineGlo Farm
Westminster, VT
(802) 463-2018

Fairy Tale Farm
Bridport, VT
(802) 758-680

Appendix F. B2B Survey Instrument

1. **Which type(s) of milk do you produce: goat, sheep, and/or cow?**
2. **How long have you been processing dairy?**
3. **Which of the following (goat, sheep, and/or cow) dairy products do you produce?**
   - Milk
   - Cream
   - Cheese
   - Yogurt
   - Butter
   - Frozen dairy
4. **What are your retail and wholesale price points for each product?**
5. **Including yourself, how many employees do you have?**
6. **What percentage more do you believe retail customers are willing to pay for your local products vs non-local products?**
7. **Estimate the percentage of your sales to rural consumers vs urban consumers.**
8. **Estimate the percentage of your income from the following sales channels:**
   - Retail/wholesale
   - Farmer's market
   - Local grocery stores
   - Institutions (colleges, hospitals, etc)
9. **Do you use a distribution company to transport your products? If yes, what is the name of your distribution company?**
10. **What types of stores or markets are you selling dairy products in?**
    - Own store
    - Locally owned/natural artisan food store
    - Regional grocery store
    - Farmer's market
    - Other [Respondent writes-in response]
11. **What is the farthest distance your product travels to a point of sale?**
12. **What are the ideal geographic markets you would like your products in?**
    - Local/Community
    - In state
    - Surrounding states
    - Regionally
    - Nationally
13. **What factors do you believe are limiting your distribution?**
14. **Do you have any thoughts on what could improve your distribution strategy?**
15. **Have you used any new or innovative approaches to processing, packaging or sales? If yes, please describe.**

16. **On a scale of 1-7, 1 being extremely dissatisfied and 7 being extremely satisfied, how satisfied are you with the current performance of your business?**
17. **Is there any additional information you think the State of Vermont Agency of Agriculture, Food, and Markets should know about producing goat and sheep dairy products?**

Appendix G. B2B Survey Tables

Table G1. Retail and Wholesale Price Points for Goat Milk Products*

Respondent	Product	Retail	Wholesale	Unit
1	Milk	$32.00	$32.00	Gallon
	Cheese	$22.40	$22.40	Pound
	Yogurt	$20.00	$20.00	Quart
	Frozen Dairy	$20.00	$20.00	Quart
2	Milk	$11.00	$11.00	Gallon
	Cheese	$9.50	$9.50	Pound
	Yogurt	$11.00	$8.00	Quart
3	Milk	$20.00	NA	Gallon
	Cheese	$30.00	NA	Pound
	Yogurt	$7.00	NA	Quart
4	Milk	$20.00	NA	Gallon
	Cheese	$18.67	$13.33	Pound
	Yogurt	$12.00	$8.00	Quart
5	Milk	$20.00	NA	Gallon
	Cheese	$28.50	$16.00	Pound
	0Yogurt	$8.50	$6.00	Quart
6	Milk	$12.00	NA	Gallon
	Cheese	$22.40	NA	Pound
7	Milk	$14.00	$10.50	Gallon
	Cheese	$15.50	$13.00	Pound
8	Milk	$16.00	NA	Gallon
	Cheese	$24.00	$14.50	Pound
9	Milk	NA	$20.00	Gallon
	Cheese	$9.00	$7.00	Pound
10	Milk	$20.00	NA	Gallon
	Cheese	$16.00	NA	Pound
11	Milk	$15.98	NA	Gallon
12	Milk	$17.00	NA	Gallon
13	Milk	$15.00	NA	Gallon
14	Cheese	$14.00	$10.00	Pound
15	Cheese	$10.50	$10.00	Pound
16	Cheese	$14.00	$11.00	Pound
17	Cheese	$21.95	$12.61	Pound
18	Cheese	$24.00	$14.50	Pound
19	Cheese	$25.00	$15.88	Pound
20	Cheese	$22.00	$11.00	Pound
21	Yogurt	$16.00	NA	Quart

Table G2. Retail and Wholesale Price Points for Sheep Milk Products

Respondent	Product	Retail	Wholesale	Unit
1	Yogurt	$40.00	$26.00	Quart
	Frozen Dairy	$18.00	$14.00	Quart
2	Yogurt	$50.00	NA	Quart

Table G3. Retail and Wholesale Price Points for Cow Milk Products

Respondent	Product	Retail	Wholesale	Unit
1	Milk	$10.00	NA	Gallon
	Cream	$8.00	NA	Quart
	Butter	$13.33	NA	Pound
	Cheese	$16.00	NA	Pound
	Yogurt	$7.00	NA	Quart
2	Cream	$12.00	NA	Quart
	Butter	$16.00	NA	Pound
	Cheese	$19.00	NA	Pound
	Yogurt	$8.00	$5.30	Quart
3	Cheese	$15.20	$11.93	Pound
4	Cheese	$24.00	$14.00	Pound

Table G4. Challenges in Distribution

Theme	Quotes
Scaling operations	• Plenty of demand, our current business model doesn't produce enough to meet it. • We work with distributors sometimes, but we are very small, so can't always meet demand. • Scale, still such a small farm so it's not economically viable to work with a distribution company. • Our supply is limited. Goats give much less milk than a cow.
Lack of infrastructure	• We need a more efficient delivery system. • We are building as fast as we can, but we need more infrastructure. • We are limited by infrastructure. We don't have a good delivery vehicle.
Other	• The actual distribution itself. Difficulty reaching stores without products with the shipping companies we use. • Regulations, not a licensed dairy farmer. Can only do direct off the farm sales. • Biggest challenge is balancing homeschooling children due to COVID-19 and working on the farm. The production is too low, and better infrastructure. • Environmental concerns regarding the shipment of food prevents us from expanding our distribution.

Table G5. Potential Improvements to Distribution Strategies

Theme	Quotes
Marketing and Direct Outreach	• Update and improve the website and advertising. • Getting the word out, more marketing. • More direct outreach. More marketing towards stores.
Improvements to Infrastructure	• Use a better vehicle for distribution. Start shipping certain products such as hard cheese. Set up ecommerce. • Need access to capital
Other	• We are noticing some niche distributors who work almost exclusively with small family farms and doing a great job. • Nutritional label testing. Long process to get this certification which is necessary to sell in many stores. • Distributors would have to be willing to make less money! I think a coop style distribution between local farmers willing to pitch in and rotate deliveries and not make a profit would work. • Food hubs, we supply our product and they distribute them to restaurants.

Table G6. Innovative Approaches in Processing, Packaging, or Sales

Theme	Quotes
Distribution	• We moved to a lot of direct online sales. We established a farm stand on the farm. • The pandemic created a huge market for online food sales, and we created a gift basket of cheeses and local jams that did very well. • Co-op where people can get dairy products from their farm and produce and meat from other farms all at the same location. • To work within the pandemic, we have had to partner with other farms and work around many businesses closing down. We added non-dairy products.
Marketing	• Incorporated humor into Facebook advertisements. • Offering samples. • Utilizes social media for marketing, especially Instragram. • For marketing to the public, the farm is composed mostly of rescue animals, previous neglected or rejected goats, which is a big selling point for their customers.
Packaging	• Using bright/colorful packaging that is environmentally friendly. • Vacuum packing • Moving to biodegradable packaging
Other	• We bought an automatic milking machine which has improved our efficiency. Cut the time by more than half, and it's more hygienic.

Table G7. Feedback for VAAFM

Theme	Quotes
Need for infrastructure and challenge with high costs	• It is very expensive to produce the product as equipment is not only expensive to set up, when something breaks, as it always does, the parts & labor to repair are very expensive. We are not able to get a high enough price on our cheese, to cover the overhead and equipment used to make the cheese. • Farmers who are practicing small scale, local, and regenerative agriculture should not struggle they way they do. The more ethical you operate, it seems the less you grow and the harder it is to survive. The current US farm system rewards the corporate model and hurts the smaller operations. Lots of large structural issues hurt goat and sheep farmers. • Infrastructure is always high on the list of needs to achieve success.
Resources	• Grants should be easier for farmers to apply for infrastructure improvements. • Dairy coalition of Maine focuses too heavily on cow milk, it would be nice to see more resources and advertising directed towards the benefits of goat milk. • Making sure that resources are available to small producers is very important. Most of the grants/fundraising are directed towards people with larger operations. It would be nice to see more assistance for smaller farmers. • Start investing in small farms, they are important.
Room for growth and the need for consumer awareness	• Goat's and sheep's mill products are in extremely high demand and there is lots of room in the market for growth, especially in fluid milk. • The goat dairy has the potential for greater growth and greater public acceptance. There are many health benefits of raw goat milk and more people should learn this. Farms need to relay this message more. • The ignorance about sheep milk out there is great. We just need to have lots and lots of sampling so people get to know how good it is!
Regulations	• It is difficult for a small operation to follow the same guidelines as large corporations as costs become a major factor. For example, running a delvo test on every batch of cheese is rather costly. • Vermont's rules regarding dairy farming are much more pro-business than New Hampshire's. • Go easy on all the regulations. It is hurting small start ups.
Labor	• Labor is another factor, as minimum wage is rising in Vermont, this in turns causes other wages increase accordingly. It is very expensive to do business in Vermont. We are having to give yearly raises at a rate of 6-7% to keep up with the rise in minimum wage and are not able to increase the price of the product by that much as stores just cannot sustain these higher prices. • It's very hard to find good employees, there is a labor shortage.